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OPERATIONAL PROCEDURES FOR SAFETY FUNCTION SUPPORT FOR COMBAT OPERATIONS

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December 20, 1991

Contract No. DAAJ09-88-D-A002

Prepared for:

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OPERATIONAL PROCEDURES FOR SAFETY FUNCTION SUPPORT FOR COMBAT OPERATIONS

EXECUTIVE SUMMARY

Requirement:

The original statement of work required research and technical assistance to develop an operational concept for the conduct of accident prevention activities in a combat theater of operations. After completion of task 3, the statement of work was modified and the requirement for an operational concept was deleted. The modified statement of work required the validation of accident data from Army accidents that occurred during Operations Desert Shield and Desert Storm. From this data, problem area profiles were developed which were used to construct safety penalties. These safety penalties were designed to be applied by exercise observer/controllers during tactical exercises at the Army's Combat Training Centers.

Procedures:

Army combat doctrine was reviewed to identify a framework within which the safety tasks required for the operational concept would fit. Interviews were conducted with 20 Army safety managers and safety officers that participated in or planned for their unit's involvement in Operations Desert Shield and Desert Storm. Representatives from the U.S. Air Force and the U.S. Navy were contacted to discover the way the safety function was executed within their respective services during Operations Desert Shield and Desert Storm. The safety tasks delineated in current Army regulations were combined with those tasks actually performed in a combat theater of operations to provide the basis for a list of potential safety functions that would likely require implementation during contingency operations.

Data extracted by subject matter experts from 467 Army accidents that occurred during Operations Desert Shield and Desert Storm was reviewed and validated. The five human error accident types within the sample included Army Motor Vehicle--Driver Error, Army Combat Vehicle--Crew Error, and Personal Injury due to either weapons handling, materiel handling, or maintenance error. The human errors were categorized within specific problem areas that were provided by the U.S. Army Safety Center, and were examined on the basis of frequency, on how likely it would be that an observer/controller would see the error being committed (observability), and on the basis of damage and injury caused by the errors (importance). Candidates were selected for the development of problem area profiles.

Problem area profiles were constructed to provide a closer look at the safety penalty candidates. The U.S. Army Safety Center selected the problems areas that would be developed into safety penalties. The penalties provided a summary of the problem area, a definition and examples of the problem area, damage and injury probabilities likely to result from an accident caused by the problem area, and a tabular display of appropriate penalties that an observer/controller should assess if the problem area was observed.

Findings:

There is no formal doctrine that specifies the duties, responsibilities, or functions of safety personnel in a combat theater of operations. No current regulations or doctrinal publications adequately address the relationship of the safety manager/officer with the rest of the staff, or the staff functions expected of the safety manager/officer in a combat theater of operations. Additionally, no tasks are specified for the safety manager/officer to assist in the preparation for safe and effective mobilization, deployment, employment, and redeployment of his or her unit. Consequently, during the full range of contingency operations, commanders are sometimes unaware of the utility of an effective safety program during combat operations, and the safety manager/officer experiences difficulty in executing effective and proactive risk assessment, management, and curtailment during this relatively high-risk period. On the basis of doctrinal and historical information, this study developed a list of potential safety functions for the safety manager/officer's use during contingency operations.

During past combat operations, human error accidents caused many deaths and injuries to soldiers and the loss of valuable vehicles and equipment. These losses can adversely affect the Army's combat power. At Army Training Centers, exercise observer/controllers frequently observe unsafe acts identical to those that lead to accidents in combat. However, while "combat losses" are incurred during training exercises as the consequence of tactical error, there are no realistic consequences incurred for the commitment of errors that, in real life, cause accidents. On the basis of the analysis of accidents that occurred both during combat and training, this study developed safety penalties designed to provide consequences for unsafe actions during training.

Utilization:

The developed list of safety functions for contingencies should form the basis for input to doctrinal publications formalizing the safety manager's position as a critical and essential member of the commander's staff.

Assessing the safety penalties developed by this study as the consequences of unsafe acts (human error) will interject additional realism into training at the Army Combat Training Centers. This realism should cause commanders to better assess and manage risk in order to reduce accidental loss of personnel and equipment that would adversely affect their mission.

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OPERATIONAL PROCEDURES FOR SAFETY FUNCTION SUPPORT OF COMBAT OPERATIONS

Introduction

Approximately 20 percent of the Army's deaths and injuries in combat occur as a result of accidents. The percentage of aircraft and other materiel losses exceeds 40. These losses directly impede combat capabilities. Studies indicate that these losses are largely preventable by means that have no adverse impact on combat capabilities. Currently, there is no established procedure(s) for conducting systematic actions to reduce accidental losses in combat. Ad hoc efforts during the Vietnam conflict produced excellent results in many situations and demonstrated the potential for success if procedures are established. Many commands from major Army command (MACOM) level and below have made test applications of combat safety procedures in various training contexts. However, lessons learned from these iterations have not been systematically assessed and developed into a standardized format for application in current U.S. Army training scenarios. This study examines safety functions in combat and accident data in a combat environment in order to develop practical yet effective means to reduce accidental combat losses through realistic training standards.

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This study was divided into two efforts which are addressed separately.

Develop An Operational Concept

Purpose

The study began with the intent of developing an operational concept for conduct of accident-prevention activities in a combat theater of operations.

Method

Task 1 of the study required the characterization of the major features of each level of combat that could be positively impacted by safety related tasks. This characterization of the major features of combat should cover the full range of contingency operations and focus on the division level. A literature search and review of current Army combat doctrine were conducted. The primary references used to identify and characterize these major features of combat included Field Manual (FM) 100-5, Operations(reference (ref)1); FM 100-10, Combat Service Support(ref 2); FM 100-15, Corps Operations(ref 3); FM 100-20, Military Operations in Low Intensity Conflict(ref 4); FM 63-4, Combat Service Support Operations - Theater Army Area Command(ref 5); FM 71-100, Division Operations(ref 6); and FM 101-5, Staff Organization and Operations(ref 7). Additionally, Army Regulation '(AR) 385-10, The Army Safety Program(ref 8); and AR 5-3, Installation Management and Organization(ref 9), were researched to discover which safety functions or tasks were typical of a division safety manager.

After the doctrine review, the levels of conflict (i.e., the full spectrum of conflict) were defined and a framework for depicting safety-related tasks was selected. Doctrinally, the levels of conflict range from low-intensity conflict through mid-high-intensity conflict, to nuclear operations. For this entire spectrum of conflict, the combat doctrine depicts contingencies developing through five distinct phases--Predeployment/Crisis Action, Deployment/Initial Combat Action, Force Buildup/Combat Operations, Decisive Combat Action, and Redeployment.

Combat doctrine describes certain combat leaders' tasks (ref 3 and 6) which should be accomplished as a contingency develops through the five phases. Several safety tasks (ref 8 and 9), and other tasks that would logically be performed as divisional units prepare to deploy, were selected and displayed concurrently with the combat leaders' tasks. This was done to illustrate how the safety function fits within the chosen framework. No currently existing Army publication addresses execution of specific safety tasks in combat.

Task 2 required the collection of information pertaining to the conduct of safety activities in a combat theater of operations. An interview guide was developed for use in obtaining information

from attendees of the Desert Shield/Storm (DS/S) Lessons Learned Conference sponsored by the U.S. Army Safety Center (USASC). Another interview guide was developed for obtaining telephonic interviews from the U.S. Navy, Air Force, and Marines. After the interview guides (appendix A) were modified in accordance with instructions from the USASC and the primary technical monitor made initial contact with the designated individuals from both the U.S. Navy and Air Force Safety Centers, the telephonic interviews were conducted. These individuals were designated by their respective services to participate in the interview after the interview guides had been reviewed. The Marine Corps elected not to participate in the interview process. Additionally, from 29 July through 2 August 1991, 20 face-to-face interviews were conducted with selected participants of the Lessons Learned Conference. Interviewees were selected on the basis of their involvement in operation DS/S. The face-to-face interviews were used not only to learn of any planning or execution deficiencies encountered by safety personnel during operation DS/S, but also to discover which tasks or functions they actually performed during deployment to, and operations in, Southwest Asia (SWA).

Task 3 required submission of a list of potential safety functions to be implemented in the various levels of contingency operations as defined in task 1. On the basis of information provided during the interviews and doctrinal information from task 1, the safety functions most frequently performed by those safety professionals who participated in DS/S were obtained. These were used, along with other functions derived from current ARs, to develop the list of safety functions compatible with operations in a combat theater and suitable for implementation during all levels of combat.

Several assumptions were made during development of this list. First, functions are defined as the actions or activities, characterized by the performance of single or multiple tasks, appropriate for a safety manager. Second, the list of functions should be consistent with current Army Safety Program goals and procedures. Third, the functions must focus on division-level activities. Fourth, the functions must support the commander's mission and the safety manager must implement them within the framework of current Army staff procedures. And finally, the functions must apply to any contingency throughout the entire spectrum of conflict; i.e., from low-intensity conflict through the high-intensity battlefield which may include chemical, biological, or nuclear warfare.

The process of developing the list of functions involved selecting specific safety functions delineated in references 8 and 9, and common staff functions contained in reference 7. These functions were then compared to actual safety-related activities performed by safety personnel during DS/S and other conflicts. Then, the selected functions were integrated within the framework of the five phases of contingency operations as

described in reference 1. Additionally, pre-notification planning requirements essential to successful preparation for contingencies were considered.

These planning requirements should be accomplished prior to notification by the National Command Authority (NCA) that participation in a contingency is imminent. Execution of these planning requirements will ensure the command safety manager is prepared to deal with issues affecting safety during the five phases of the contingency.

First, the safety manager must project realistic requirements which can be accomplished in the combat theater. All the duties and responsibilities listed in references 8 and 9 may not be applicable or required for any particular contingency operation. The first consideration when developing these requirements is the unit's mission as stated in the existing operation plans (OPLANS).

Second, the safety manager must select those safety functions that will enhance the probability of the commander accomplishing his stated mission, and those that can be realistically accomplished in a wartime environment. Third, these functions must be prioritized based on mission requirements. Once developed, this list of requirements becomes the safety manager's Mission Essential Task List (METL). The METL provides the focus for the application of the safety function in combat. An example of a wartime METL is that developed by U.S. Army Europe (USAREUR) and 7th Army: Accident Reporting and Analysis; Risk Assessment; Education, Training, and Awareness; Statutory Compliance, and Countermeasure Development.

The existing OPLAN and the administrative and logistic plan should be reviewed to give the safety manager a clear picture of the operation and the accompanying Combat Service Support (CSS) requirements. This will allow the safety manager to better plan his risk assessment priorities. The OPLAN is useful in identifying deploying units to support the contingency and providing a concept of the expected operation. Examination of the administrative and logistic plan will enable the safety manager to obtain information about quantities of various classes of supply, proposed locations of supply points and ammunitions transfer points, traffic control and regulation measures, and the location of the main supply routes (MSRs). Particular emphasis should be given to the road movement annex which contains information on the order of march, routes, traffic density, speed limits, lighting, and instructions for halts.

Analysis of the area of operations should be obtained from the staff intelligence officer and used to conduct a risk assessment of the geographical and environmental aspects of the contingency area. These factors should indicate requirements for appropriate Aviation Life Support Equipment and Organizational Clothing and Individual Equipment requirements and other potential health or physiological risk factors. Additionally, if

the contingency area requires different camouflage from that currently used by the units' vehicles and equipment, there may be immediate industrial hygiene issues from the requirement to paint all vehicles and equipment with chemical agent resistant coating paint.

The safety manager should monitor training to ensure that specific safety training relative to expected activities in a combat theater is adequately addressed. Previous experience indicates that increased emphasis should be given individual weapons and ammunition-handling safety, dud/unexploded ordnance recognition and hazards, and other theater unique hazards such as extremes in environment, appropriate personal hygiene for the conditions, insect and reptile hazards, and disease prevention and control.

Finally, the safety staff required to support combat activities during the contingency must be identified, trained, and prepared for deployment. These persons must be included on the Time Phased Force Deployment Data List for timely deployment. In addition to basic soldier skills and Preparation for Overseas Movement requirements, specific safety functions that may be modified for the combat environment should be reviewed. An example is accident investigation procedures. The proponent may prescribe modified procedures which may be further changed by the MACOM. Review of these combat-unique procedures is necessary prior to deployment.

Results

Task 1 required definition of the full range of contingency operations and the characterization of the major features of each level of combat that might be positively impacted by safety. Each of the five phases of combat can be applicable throughout the full spectrum of conflict. Safety manager tasks are displayed concurrently with combat leader tasks to illustrate that each phase of combat could potentially receive positive impact from safety-related activities. Table 1 summarizes this information:

TABLE 1

Predeployment Phase

<u>Combat Leader Tasks</u>	<u>Safety Manager Tasks</u>
Select and tailor the force.	Inspect and evaluate safety related activities of deploying units.
Determine transportation requirements.	Review accident prevention aspect of OPLANs, load plans, standing operating procedures (SOPs), etc.
Develop and conduct specified training.	Assist commander by integrating safety considerations into pre-operations training.
Plan and organize the command and control function.	Evaluate geographical and environmental aspects of the theater of operations
Select and define operational concepts.	Monitor loading of equipment at home station, point of departure (POD), and point of entry (POE)
	Prepare safety staff for deployment.

Deployment Phase

Combat Leader Tasks

Assign missions to the advance forces

Secure lodgment.

Provide security for lead elements in the battle area.

Initiate reconnaissance forward of the battle area.

Establish command and control.

Safety Manager Tasks

Monitor POE, POD, and lodgment area operations.

Monitor CSS operations.

Provide safety estimate of the situation.

Investigate accidents (non-combat related).

Force Buildup Phase

Combat Leader Tasks

Prepare for follow-on forces.

Rapidly expand combat operations.

Transfer command and control to higher headquarters.

Expand the lodgment.

Expand the logistics base CSS capabilities.

Safety Manager Tasks

Continue to monitor POE/lodgment operations.

Conduct preliminary hazard analysis of non-hostile risks.

Update commander on assessment of most significant risks.

Continue to evaluate CSS and rear area operations.

Collect data and provide status reports.

Continue to investigate accidents.

Continue to integrate safety considerations into training.

Decisive Combat Action Phase

Combat Leader Tasks

Further expand combat operations

Obtain and employ additional combat, combat support (CS), and CSS forces, as required.

Destroy and neutralize the enemy's center of gravity.

Safety Manager Tasks

Continue accident investigation (modified).

Continue risk assessment of significant non-hostile operations and functions.

Continue site surveys and safety assistance visits in rear area.

Continue to monitor accident trends and provide appropriate countermeasures.

Redeployment Phase

Combat Leader Tasks

Reconstitute forces for future contingencies.

Reorganize command and control to execute redeployment.

Continue to provide adequate security for withdrawing forces.

Determine transportation requirements.

Redeploy as rapidly as possible.

Safety Manager Tasks

Review redeployment plans, load plans, etc.

Compile statistics reflecting pertinent accident rates and trends of the operation.

Prepare initial safety after action report/lessons learned.

Monitor POD and POE operations

Prepare safety staff for redeployment.

Information gathered during task 2 indicated that the Army was the only service to deploy civilian safety professionals to SWA. With the exception of some Seabee Operations in Saudi Arabia, the U.S. Navy's involvement was primarily deployment of additional battle groups to the Persian Gulf, Mediterranean and Red Seas in support of DS/S. There were no civilian safety personnel involved in any Navy operations, nor did the U.S. Air Force deploy civilian safety personnel. Additionally, Air Force activities in SWA were primarily located on fixed bases in support of air operations. This type of operation involved few of the more difficult aspects of managing a safety program encountered by Army safety personnel.

Of the 20 Army safety professionals and Army safety officers interviewed, 14 had deployed to the combat theater and the remaining 6 were involved with troop deployment from either the continental U.S. bases or Europe. Three military (all grade 05) and 17 Department of the Army Civilians (grades GS-9 - GM-14) were interviewed. MACOMS represented were Army Central Command, Forces Command, Training and Doctrine Command, USAREUR, National Guard Bureau, and Military Traffic Management Command. Personnel interviewed had an average of 13.5 years of Army safety experience. Experience of the interviewees ranged from 1 year to 31 years. These personnel represented operational levels of theater army, corps, support command, division, medical command, support group, and engineer brigade.

The interviews revealed many safety problem areas dealing with both planning for the contingency and executing effective accident prevention programs in theater. These problem areas were due to many reasons, but the lack of written guidance or doctrine prescribing safety functions or tasks to be performed during contingency operations was a recurring complaint among those interviewed.

The list of safety functions required by task 3, follows:

SAFETY FUNCTIONS FOR CONTINGENCIES
(Division Level)

Predeployment Phase

Review the OPLAN or operation order (OPORD) and identify units participating in the contingency. Develop a plan for evaluating the safety posture of the deploying units.

- Ensure collateral duty safety officers are prepared with the minimum necessary safety forms, records, and publications to function in the theater.
- Review unit's previous accident history.
- Assist the commanders in identifying and preparing for potential hazards that would likely occur to this type of unit in the anticipated contingency area.

Monitor equipment preparation and loading at home base, equipment movement to POD, and equipment loading at POD. Emphasis should focus on:

- Availability of adequate blocking and tiedown equipment.

- Adequate traffic control measures, rest halts for extended convoy operations, realistic time constraints for convoy movement, and crew endurance/fighter management considerations.
- Availability of proper materiel-handling equipment.
- Use of proper tools and equipment, lifting techniques, and ground guides.
- Occupational Safety and Health Act (OSHA) compliance with industrial hygiene requirements if equipment repainting is required.

Conduct risk assessment of the storage and handling of hazardous materials (Class III and V).

- Provide risk assessment of up loading combat vehicles with basic load prior to deployment.
- Ensure required markings for road transport of Class III materials are available and utilized by vehicles line-hauling to port or railhead.
- Plan for adequate space to meet Department of Defense (DOD) quantity distance requirements for temporary storage of Class V at port or railhead.

Coordinate requirements for the deployment of safety staff:

- Prepare preplanned safety staff transportation for shipment.
- Coordinate for the shipment of equipment and administrative requirements necessary to provide the safety function in-theater.
- Coordinate life support requirements for safety staff in division main command post.

Review OPORD and the administrative and logistic order.

- Verify expected quantities of various classes of supply and the proposed locations of supply points and ammunition transfer points.
- Review traffic control and regulation measures.
- Verify the order of march, routes, traffic density, speed limits, lighting, and instruction for halts.
- Verify the proposed locations of the MSRs.

Time permitting, conduct or assist in the conduct of specific

safety training on issues unique to wartime scenario in the selected contingency area.

Deployment Phase

Monitor or coordinate for the monitoring of equipment unloading at POE. Emphasis should focus on:

- Availability of adequate blocking and tie down equipment.
- Adequate traffic control measures, rest halts for extended convoy operations, realistic time constraints for convoy movement, and crew endurance/fighter management considerations.
- Availability of proper materiel-handling equipment.
- Use of proper tools and equipment, lifting techniques, and ground guides.
- OSHA compliance with industrial hygiene requirements if equipment repainting is required.

Develop and implement policy to provide adequate risk control measures for unanticipated hazards. Examples include senior occupant requirements for vehicles, range fan requirements for in-theater live-fire training, and quantity distance requirements for Class V storage. Compare home base requirements with theater requirements, assess relative risk, evaluate results, and modify policy, as necessary.

Monitor equipment movement from POE to initial assembly area.

- Assist in the development of orientation training (host nation driving rules/customs) for all drivers.
- Review traffic control and regulation measures.
- Verify the order of march, routes, traffic density, speed limits, lighting, and instructions for halts.
- Stress discipline. Require use of seat belts, compliance with predesignated speed limits, and rules of the road and enforce uniform and equipment requirements.

Begin accident reporting and investigation utilizing previously developed and coordinated abbreviated reporting and investigation procedures. Emphasis should be placed on:

- Rapid collection of data, rapid return of assets to the commander, and development of mission supportive countermeasures.
- Thorough investigation of only those accidents with potential "show stopping" human or materiel failures.

Conduct safety-assistance visits of units as they occupy initial assembly areas and troop billeting areas.

- Maintain a high level of safety awareness. Emphasize that safe procedures and practices still apply.
- Conduct informal risk assessments of assembly areas and make on-the-spot verbal recommendations to unit leaders.
- Provide risk assessment of fire hazards in troop billeting areas, and assist in developing preventive countermeasures.

Prepare the initial safety estimate of the most significant non-hostile risks for the commander.

1. Mission
2. Safety climate based on:
 - a. Personal observation
 - b. Conversations with soldiers
 - c. Accident experience
3. Analysis of risk factors based on:
 - a. Weather
 - b. Terrain
 - c. Crew endurance/fighter management factors
4. Materiel and services risk factors
 - a. Transportation
 - b. Class III storage and handling
 - c. Class V storage and handling
 - d. Facilities and equipment
5. Host nation compliance considerations
6. Other considerations
7. Probability and severity ranking of risk factors
8. Conclusions and Recommendations

Force Buildup Phase

Monitor or coordinate equipment unloading at POE. Emphasis should focus on:

- Availability of adequate blocking and tiedown equipment.
- Adequate traffic control measures, rest halts for extended convoy operations, realistic time constraints for convoy movement, and crew endurance/fighter management considerations.
- Availability of proper materiel-handling equipment.

- Use of proper tools and equipment, lifting techniques, and ground guides.
- OSHA compliance with industrial hygiene requirements if equipment repainting is required.

Develop, implement, and modify (if necessary) policy to provide adequate risk control measures for unanticipated hazards. Evaluate results.

Coordinate with the Provost Marshal to ensure necessary safety considerations are implemented in enemy prisoner of war camps or compounds.

- Coordinate with other appropriate staff to ensure minimum essential safety and hygiene requirements are met.
- Develop fire safety and evacuation procedures consistent with security requirements.

Monitor equipment movement from POE to initial assembly area.

- Assist in development of driver orientation training (host nation driving rules/customs).
- Review traffic control and regulation measures.
- Verify the order of march, routes, traffic density, speed limits, lighting, and instructions for halts.
- Stress discipline. Require use of seat belts, compliance with predesignated speed limits and rules of the road and enforce uniform and equipment requirements.

Conduct accident reporting and investigation, utilizing abbreviated reporting and investigation procedures. Emphasis remains on:

- Rapid collection of data, rapid return of assets to the commander, and development of mission supportive countermeasures.
- Thorough investigation of only those accidents with potential "show stopping" human or materiel failures.

Evaluate units' safety posture. Informal spot visits to units in their assembly areas should focus on proper safety attitudes and accident prevention awareness. Special emphasis should be placed on the dangers of duds and unexploded ordnance. Provide updated safety estimates on request or as needed. Briefings, on request or as needed, focus on changes in significant risks.

Provide the commander with a periodic safety status report.

1. Safety climate

2. Accident review

a. Class A and B

(1) Frequency

(2) Fatalities, injuries, and equipment losses

(3) Probable causes

(4) Impact on war-fighting capability

(5) Proposed or implemented countermeasures

b. Class C, D and significant E summary

3. Status of previously identified hazards and the results of countermeasures implemented to abate the hazards

4. Newly identified hazards and proposed countermeasures

5. Miscellaneous

Decisive Combat Action Phase

Shift risk identification and assessment focus to CSS activities in rear area to prevent the loss of necessary personnel, supplies, and equipment due to accidents.

Develop, implement, and modify (if necessary) policy to provide adequate risk control measures for unanticipated hazards. Evaluate results.

Evaluate safety posture of CSS units. Informal spot visits to their assembly areas should focus on proper safety attitudes and accident-prevention awareness. Special emphasis should be placed on the dangers of duds and unexploded ordnance.

Conduct accident reporting and investigation, utilizing abbreviated reporting and investigation procedures.

Investigation emphasis shifts to CSS units. Further modification of accident investigation procedures may be required for units engaged in combat. Emphasis remains on:

- Rapid collection of data, rapid return of assets to the commander, and development of mission supportive countermeasures.
- Thorough investigation of only those accidents with potential "show stopping" human or materiel failures.

Provide the commander with periodic safety status reports as required.

1. Safety climate
2. Accident review
 - a. Class A and B
 - (1) Frequency
 - (2) Fatalities, injuries, and equipment losses
 - (3) Probable cause
 - (4) Impact on war-fighting capability
 - (5) Proposed or implemented countermeasures
 - b. Class C, D and significant E summary
3. Status of previously identified hazards and the results of countermeasures implemented to abate the hazards
4. Newly identified hazards and proposed countermeasures
5. Miscellaneous

Provide updated safety estimates on request, or as plans are developed. Provide updated estimates, focusing on changes in significant risks.

Redeployment Phase

Review and provide risk assessment input to plans outlining redeployment of units from the contingency area.

- In order to prioritize safety activities, identify the order in which units will redeploy.
- Assist in developing a campaign to prevent the collection or possession of war trophies or dud munitions including provisions for an amnesty turn-in program.
- Plan for extensive safety campaign reiterating the need for compliance with by-the-book procedures to prevent accidental loss of life.

Monitor equipment preparation, movement, and loading within the theater. Emphasis should focus on:

- Availability of adequate blocking and tiedown equipment.

- Adequate traffic control measures, rest halts for extended convoy operations, realistic time constraints for convoy movement, and crew endurance/fighter management considerations.
- Availability of proper materiel-handling equipment.
- Use of proper tools and equipment, lifting techniques, and ground guides.
- OSHA compliance with industrial hygiene requirements if equipment repainting is required.

Prepare safety staff for redeployment and redeploy.

Monitor or coordinate equipment unloading at POE and equipment transport from POE to home base. Emphasis should focus on:

- Availability of adequate blocking and tiedown equipment.
- Adequate traffic control measures, rest halts for extended convoy operations, realistic time constraints for convoy movement, and crew endurance/fighter management considerations.
- Availability of proper materiel-handling equipment.
- Use of proper tools and equipment, lifting techniques, and ground guides.
- OSHA compliance with industrial hygiene requirements if equipment repainting is required.

Compile accident statistics pertaining to operations in the combat theater, analyze pertinent trends derived from the statistics, and provide the necessary input into future plans, training, etc., in an effort to abate these accidents.

Prepare initial safety after action reports/lessons learned.

Develop and implement plans to increase safety awareness during period of reunion between soldiers and families.

- Increase awareness of driving and traffic safety, especially long trips without adequate rest.
- Increase awareness of the hazards of driving under the influence of alcohol.
- Monitor possible indications of short- or long-term health hazards due to prolonged effects of systemic medications used or exposure to environmental hazards in the contingency area.

Upon completing task 3, the Army shifted the focus of the study to development of information from accident data derived from DS/S ground accidents. The information gathered was to be used by the Army to develop procedures which can be integrated into training scenarios at the Army's combat training centers (CTCs). This information and these procedures will be used subsequently to validate and evaluate the contingency operation safety functions developed in tasks 1-3.

Develop Safety Penalty Candidates

Introduction

The remainder of the study tasks focused on use of the DS/S combat accident data to develop practical yet effective means to reduce future accidental combat losses through realistic training standards. Incorporation of realistic consequences for unsafe behavior, based on combat accident experience, is one way to integrate safety into training. In order to accomplish this, accident causing behaviors and associated consequences (i.e., injuries and equipment damage) must be identified.

Purpose

The purposes of the remaining tasks were:

1. Validate previously identified unsafe behaviors and the operational environment in which they occurred during DS/S (accident problem areas).
2. Identify the most important problem areas in DS/S combat accidents (i.e., in terms of frequency, and severity) which should be observable during training exercises at CTCs (penalty candidates).
3. For those problem areas, develop safety penalties (realistic consequences) for use during training exercises.

Method

Prior to task 4 of this study, USASC research analysts and subject matter experts (SMEs) reviewed DS/S accident data and, for each accident, identified key data elements and the accident problem area. The types of accidents examined and corresponding problem areas (PAs) are listed in Table 2.

Table 2
Accident Types and Problem Areas

Army motor vehicle (AMV) driver error:

- PA1 - Excessive speed for road/weather/visibility conditions; posted/specified limits; or vehicle design/load
- PA2 - Unsafe road conditions (improper precautions for)
- PA3 - Night/Excessive duty hours (night and/or duty hours in excess of 8 or driving while fatigued when not necessary/directed)
- PA4 - Improper turning by failure to yield right of way, over steering during a turn, or improper U-turn
- PA5 - Unsafe mechanical condition - inadequate before-during-after operation inspection/check
- PA6 - Improper passing by misjudging the clearance available for the vehicle being passed or oncoming vehicle, passing at an unsafe place/time

PA7 - Following too close for environmental/road conditions; vehicle braking ability (design/load); or driver reaction time ability

Army combat vehicle (ACV) crew error:

PA1 - Inadequate inspection or check of vehicle before, during or after operation
PA2 - Rough terrain (improper precautions for)
PA3 - Excessive speed for road/weather/visibility conditions; posted/specified limits; or vehicle design/load
PA4 - Darkness/Fatigue
PA5 - Improper ground guiding
PA6 - Inadequate crew coordination/communication

Personnel injury (PI) - weapons handling:

PA1 - Sighting/aiming/firing/throwing
PA2 - Unauthorized use/handling
PA3 - Carrying/lifting/transporting
PA4/8 - Failure to properly clear (when disarming/unloading, assembling/cleaning/dissemsbling)
PA5 - Body Positioning
PA6 - Loading/arming
PA7 - Emplacing

PI - Materiel handling:

PA1 - Improper technique (while lifting/lowering/holding, carrying/maintaining balance/footing)
PA2 - Unsecured/unstable load
PA3 - Environmental hazard (inadequate precautions for)
PA4 - Getting on/off vehicle improperly
PA5 - Equipment usage

PI - Maintenance:

PA1 - Improper use of tools/equipment
PA2 - Improper lifting
PA3 - Improper body position
PA4 - Improperly secured materiel/equipment/vehicle
PA5 - Improper push/pull, grip/hold
PA6 - Inadequate inspection (components/equipment/work area)
PA7C - Improper procedures

USASC provided the information to be validated in worksheet form, accompanied by computer printouts of the accident reports from which the information was developed. Validation of accident

case data required verification that certain data elements selected by USASC SMEs were correct on the basis of the evidence available in the accident reports. Data elements identified by the SMEs included accident case number, the human error committed, Social Security Account Number of the person committing the error, and the correct identification of the type of accident. Specific coded entries were made which identified the type of road surface (AMV/ACV only), whether the vehicle was in convoy (AMV/ACV only), whether the individual was using a night vision device, and what, if any, environmental factors were present. Problem area codes were assigned from a list of potential problem areas provided by the USASC that pertained to each one of the five categories of accidents. Additional problem area codes were developed as necessary. Only one problem area was assigned per accident case. Codes were also listed that identified how observable (very likely, likely, not likely) the error would be to an exercise observer/controller (OC), and how important (high, medium, low) the risk of this error/problem area was in terms of accident frequency, injury, and damage.

During the validation process, an attempt was made to identify additional data elements for the PA profiles. If narrative information in the accident report was adequate, the mission (collective) task and the military occupational specialty (MOS) common task being performed by the individual were identified. Also identified, when possible, was the systemic failure (i.e. standard failure, training failure, leader failure, support failure, individual failure) that caused the error. Finally, codes were validated and extracted pertaining to the individual's activity, the accident type of location, the vehicle/weapon/equipment used/involved, the extent of the damage, and the number, type, and severity of injuries resulting from the accident.

The reports were reviewed and discrepancies noted on the worksheets provided by USASC. Differences were resolved during periodic informal meetings between the USASC point of contact and the contractor analyst. Table 3 illustrates the number of accident cases validated for each of the five accident categories.

Table 3
Number of Accident Cases Validated

	No. of Cases <u>Validated</u>	No. of Cases <u>Rejected</u>	N
AMV (Class A-D)	193	4	189
ACV (Class A-C)	29	1	28
PI - Weapons handling (Class A-C)	73	2	71
PI - Materiel handling (Class A-C)	88	0	88
PI - Maintenance (Class A-C)	<u>84</u> 467	<u>1</u> 8	<u>83</u> 459

Analysis sheets extracting all data items required by the study were constructed. Correct identification of proper problem areas was necessary in order to develop the PA profiles required in task 5.

Analysis sheets for all five accident categories were examined. PA profiles were constructed for the problem areas that occurred most frequently within the five accident categories. PAs that were not selected based on frequency were screened to ensure that there were no infrequently occurring problem areas that contained a disproportionate amount of importance/risk, i.e., high levels of damage and/or injury found consistently in a problem area with low N. No aberrations were discovered.

The problem areas selected for the construction of PA profiles are listed below. PA numbers may repeat within the five accident categories but still represent a different PA in each category.

AMV Driver Error

PA1 - Excessive speed for road/weather/visibility conditions; posted/specified limits; or vehicle design/load.

PA3 - Night or excessive duty hours (night and/or duty hours in excess of 8 or driving while fatigued when not necessary or directed).

PA4 - Improper turning by failure to yield right of way, over steering during a turn, or improper U-turn.

PA6 - Improper passing by misjudging the clearance available for the vehicle being passed, passing at an unsafe place or time.

PA7 - Following too close for environmental/road conditions; vehicle braking ability (design/load); or driver reaction time ability.

PA 17a - Driver inattention.

ACV Crew Error

PA1 - Inadequate inspection or check of vehicle before, during, or after operation.

PA6 - Inadequate crew coordination or communication including:

- Improper action sequence - Improper sequencing or timing of actions with other crew members.
- Failure to offer assistance/information/warning requested or needed by another crewmember(s).

- Lack of positive communication (transmission, acknowledgement, confirmation) using standard terminology with specific qualifiers.
- Failure to announce a decision or action that affects other crewmembers' duties.
- Failure to direct or request assistance from other crewmember(s).

PI - Weapons-Handling Error

PA2 - Unauthorized use or handling of weapons, ammunition, or ordnance.

PA4/8 - Failure to properly clear weapon prior to assembling, disassembling, cleaning, disarming, or unloading. (This PA consolidated two originally separate PAs into one category due to their similarity).

PI - Materiel-Handling Error

PA1 - Using improper technique while lifting or lowering, maintaining balance or footing, pushing or pulling, or holding or carrying.

PA2 - Failure to properly secure an insecure or unstable load.

PA3 - Taking inadequate precautions for environmental conditions.

PI - Maintenance

PA1 - Improper use of tools or equipment; i.e., did not use the correct tool or equipment although it was required and available; used the correct tool or equipment but used it improperly; or used incorrect tool or equipment.

PA3 - Improper body position.

PA6 - Inadequate inspection of components, equipment, or work area before or during maintenance work.

PA7C - Using improper procedures.

Table 4 depicts the frequency of each selected PA within each accident category and the percentage of accidents represented within each sample:

TABLE 4
Problem Area Frequency within Accident Category

AMV Driver Error

# of Accidents in Sample	# of Accidents in Top 6 PAs	% of Accidents in Top 6 PAs	Top 6 PAs				
			PA7	PA1	PA17a	PA3	PA4
189	136	72	40	30	21	17	15

ACV Crew Error

# of Accidents in Sample	# of Accidents in Top 2 PAs	% of Accidents in Top 2 PAs	Top 2 PAs	
			PA6	PA1
28	12	43	7	5

PI - Weapons Handling

# of Accidents in Sample	# of Accidents in Top 2 PAs	% of Accidents in Top 2 PAs	Top 2 PAs	
			PA4/8	PA2
71	34	48	24	10

PI - Materiel Handling

# of Accidents in Sample	# of Accidents in Top 3 PAs	% of Accidents in Top 3 PAs	Top 3 PAs		
			PA1	PA3	PA2
88	54	61	41	7	6

PI - Maintenance

# of Accidents in Sample	# of Accidents in Top 4 PAs	% of Accidents in Top 4 PAs	Top 4 PAs			
			PA1	PA3	PA7C	PA6
83	62	75	27	13	13	9

Complete PA profiles for each PA listed above are found in Appendix B.

Problem Area Observability

Problem area profiles in each of the five accident categories were examined to determine which PAs an OC at an Army CTC could reasonably expect to observe and identify, real-time, during training. Each occurrence of a specific PA was given an observability rating by USASC SMEs based on the context the PA was presented within the accident report. Observability ratings ranged from a high of 1 (most likely to observe and identify) to a low of 3 (least likely to observe and identify). These ratings were totalled for each PA group and an overall value for the group was assigned based on the observability rating average. Observability ratings for the most frequently occurring PAs in each accident category are depicted in descending order of observability in Table 5.

TABLE 5
Problem Area Observability

AMV Driver Error

<u>PA#</u>	<u>PA Description</u>	<u>Observ Rating</u>	<u>Observ Rank</u>	<u>Freq Rank</u>	<u>N</u>
1	Excessive speed	1.83	1	2	30
7	Following too close	2.10	2	1	40
6	Improper passing	2.62	3	6	13
4	Improper turning	2.67	4	5	15
3	Night/duty hours > 8	2.69	5	4	17
17a	Driver inattention	2.86	6	3	21

ACV Crew Error

<u>PA#</u>	<u>PA Description</u>	<u>Observ Rating</u>	<u>Observ Rank</u>	<u>Freq Rank</u>	<u>N</u>
6	Crew coord/commo	1.80	1	1	7
1	Inad insp/check	3.00	2	2	5

PI - Weapons Handling

<u>PA#</u>	<u>PA Description</u>	<u>Observ Rating</u>	<u>Observ Rank</u>	<u>Freq Rank</u>	<u>N</u>
2	Unauth use/handling	2.00	1	1	10
4/8	Improper clearing	3.00	2	2	24

PI - Materiel Handling

<u>PA#</u>	<u>PA Description</u>	<u>Observ Rating</u>	<u>Observ Rank</u>	<u>Freq Rank</u>	<u>N</u>
2	Fail to secure load	1.34	1	3	6
3	Inad prec-env haz	2.00	2	2	7
1	Improper Technique	2.46	3	1	41

PI - Maintenance

<u>PA#</u>	<u>PA Description</u>	<u>Observ Rating</u>	<u>Observ Rank</u>	<u>Freq Rank</u>	<u>N</u>
1	Using imp tool/equip	1.14	1	1	27
7c	Improper procedures	1.15	2	T2	13
3	Improper body position	1.92	3	T2	13
6	Inad Insp comp/equip	2.00	4	3	9

Also examined was a list of safety comments or observations made by exercise OCs during training at the U.S. Army National Training Center (NTC) during fiscal year (FY) '89. A total of 208 of these comments were examined, and 30% of them could be related to PAs that were identified during the accident case

validation and selected for profiles. The only PAs selected for profiles that had no OC observations or comments relating to them were: PA17a - driver inattention (AMV driver error); PA8 - improper clearing of weapon prior to assembly, disassembly, or cleaning (PI weapons handling); PAs 1a, 1b, 1c, and 1d - improper technique for hold/carry, lift/lower, push/pull, and balance/footing (PI - materiel handling); and PA2 - failure to properly secure an insecure/unstable load (PI - materiel handling).

Problem Area Importance

Problem area profiles in each of the five accident categories were examined to determine which PAs represented the greatest importance to the Army on the basis of injury and damage factors. Each occurrence of a specific PA was given an importance rating by USASC SMEs based on the context the PA represented within the accident report. Like observability ratings, importance ratings ranged from a high of 1 (most important based on injury and damage factors) to a low of 3 (least important based on injury and damage factors). However, since the reviewed accident reports contained injury and damage information, it was possible to extract this information from the reports and use it to verify the importance ratings assigned by the USASC SMEs. Vehicle and property damage in the accident reports were listed as totally destroyed (TD); damaged, inoperative (DINOP); damaged, partially operational (DPTOP); and damaged, fully operational (DFOP). These terms were assigned numerical values 4 - 1 respectively, and then totalled for each PA to obtain the damage factor. Injuries in the accident reports were listed as fatal, permanent total disability, permanent partial disability, lost workday, restricted work activity, and first aid only. These terms were assigned numerical values 6 - 1 respectively, and likewise totalled for each PA to obtain the injury factor. These values were used to rank each problem area in terms of importance rather than the more subjective ratings assigned by the SMEs. Importance ratings for the most frequently occurring PAs in each accident category are depicted in descending order in Table 6.

TABLE 6
Problem Area Importance

PA#	PA Description	AMV Driver Error			Importance Rank
		Damage Factor	Injury Factor	Total Imp. Factor	
1	Excessive speed	80	111	191	1
7	Following too close	96	23	119	2
17a	Driver inattention	60	57	117	3
4	Improper turning	39	38	77	4
3	Night/Duty hours >8	46	24	70	5
6	Improper passing	14	36	50	6

ACV Crew Error

<u>PA#</u>	<u>PA Description</u>	<u>Damage Factor</u>	<u>Injury Factor</u>	<u>Total Imp. Factor</u>	<u>Importance Rank</u>
6	Crew coord/commo	0	22	22	1
1	Inad insp/check	3	16	19	2

PI - Weapons Handling

<u>PA#</u>	<u>PA Description</u>	<u>Damage Factor</u>	<u>Injury Factor</u>	<u>Total Imp. Factor</u>	<u>Importance Rank</u>
2	Unauth use/handling	3	162	165	1
8	Improper clearing	1	47	48	2

PI - Materiel Handling

<u>PA#</u>	<u>PA Description</u>	<u>Damage Factor</u>	<u>Injury Factor</u>	<u>Total Imp. Factor</u>	<u>Importance Rank</u>
1	Improper technique	NA	125	125	1
2	Fail to secure load	NA	40	40	2
3	Inad prec-env haz	NA	21	21	3

PI - Maintenance

<u>PA#</u>	<u>PA Description</u>	<u>Damage Factor</u>	<u>Injury Factor</u>	<u>Total Imp. Factor</u>	<u>Importance Rank</u>
1	Using imp tool/equip	NA	85	85	1
3	Imp body position	NA	40	40	2
7c	Improper procedures	NA	33	33	3
6	Inad insp comp/equip	NA	27	27	4

On the basis of frequency, importance ratings, observability ratings, and the individual PA profiles, the following problem areas within the five accident categories were briefed to the USASC (as required by Task 5c) as potential candidates for development of safety penalties:

AMV Driver Error: PA7 - Following too close for environmental/road conditions; vehicle braking ability (design/load); or driver reaction time ability; and PA1 - Excessive speed for road/weather/visibility conditions; posted/specify limits; or vehicle design/load.

ACV Crew Error: PA1 - Inadequate inspection or check of vehicle before, during, or after operation; and PA6 - Inadequate crew coordination or communication.

PI Weapons-Handling Error: PA8 - Failure to properly clear weapon prior to assembling, disassembling, or cleaning; and PA2 - Unauthorized use or handling of weapons, ammunition, or ordnance.

PI Materiel-Handling Error: PA1 - Using improper technique while lifting or lowering, while maintaining balance or footing, while pushing or pulling, or while holding or carrying; PA3 - Taking inadequate precautions for environmental conditions; and PA2 - Failure to properly secure or stabilize a load.

PI Maintenance: PA3 - Improper body position; PA7c - Using improper procedures; PA1 - Improper use of tools or equipment; i.e., did not use the right tool or equipment even though it was required and available; or used the correct tool or equipment but used it improperly; or improper use of equipment; i.e., used wrong tool or equipment; PA6 - Inadequate inspection of components, equipment, or work area before or during maintenance work.

After comparing these DS/S accident data and damage and injury profiles to accident data from the NTC, USASC representatives amended some PA definitions, and requested that safety penalties be developed for the following problem areas:

AMV Driver Error: PA7 - Following too close for environmental/road conditions; vehicle braking ability (design/load); or driver reaction time; and PA1 - excessive speed for road/weather/visibility conditions; posted/specified limits; or vehicle design/load.

At the request of USASC, AMV problem areas were then subdivided into vehicle weight classes to ensure that injury and damage penalties would remain consistent with actual accident experience. PAs 3, 4, 6 and 17A were eliminated.

ACV Crew Error: PA1 - Inadequate inspection/check of vehicle before, during, or after operation; PA3 - Excessive speed for road, weather, or visibility conditions; and PA6 - Inadequate crew coordination or communication (PA 3 was added at the request of USASC).

PI Weapons-Handling Error: PA4/PA8 - failure to properly clear weapon while disarming or loading or prior to assembling, disassembling, or cleaning (rifle, pistol and machinegun only); and PA2 - Unauthorized use or handling of simulators, pyrotechnics, Hoffman devices, etc.

At the request of USASC, the weapons handling profile was changed to eliminate those accidents within PA2 that involved dud munitions, since those type of errors rarely, if ever, occur at CTCs. Rather, the safety penalties at the CTCs apply more appropriately to the unauthorized use or handling of pyrotechnics such as artillery simulators, antitank weapons effect signature simulators (ATWESS), Hoffman devices, etc.. Five additional accident reports that occurred at the NTC involving these types of pyrotechnics were added to the sample to ensure more valid injury data.

PI Materiel-Handling Error: PA1A- Using improper technique while lifting or lowering or using improper technique by attempting to handle excessive load without sufficient manpower (failure to ask for

assistance); and PA3 - Taking inadequate precautions for environmental conditions.

At the request of USASC, other PA subcategories within PA1 (Materiel - Handling Error), i.e., using improper technique while maintaining balance or footing, pushing or pulling, or holding or carrying were eliminated. Also, 5 additional NTC accidents from PA3 were added and PA2 (Failure to Properly Secure an Insecure or Unstable Load) was eliminated.

PI Maintenance: PA1 - Improper use of tools or equipment; i.e., did not use the correct tool although it was required and available; or used the correct tool or equipment but used it improperly; or used incorrect tool or equipment. This category was expanded to include hand tools; hoists, jacks, and lifts; and protective clothing and equipment.

At the request of USASC, PAs 3, 6 and 7c were eliminated.

Accident cases were reexamined, and PA profile data sheets (appendix C) compiling previously extracted data fields from the individual profiles were constructed to assist in the development of the safety penalties. Damage and injury criteria were based on lists furnished by the USASC. Damage listed on the Army accident reports was converted to the following USASC provided damage codes on the basis of cost and narrative descriptions found in the reports; TD - totally destroyed; DINOP - damaged and inoperable, but not totally destroyed; DPTOP - damaged and partially operable; and DFOP - damaged but fully operable. Injury data on Army accident reports were coded by injury severity; i.e., a = fatal, b = permanent total disability, c = permanent partial disability, d = lost workday, e = restricted work activity, and f = first aid only. Additionally, the major body part injured and the type of wound or injury were extracted from the report and included in the profile data sheets. Finally, the number of days lost for each injury were extracted.

Injury and damage data were then compiled and analyzed to formulate the safety penalties. These penalties attempt to replicate as closely as possible the typical injury and damage that would be sustained should the PA result in actual accident during combat or training.

Damage penalties were expressed in terms of lost operational capabilities or days the vehicle would be lost to the unit, corresponding to the damage codes described above. Damage penalties were listed to correspond as closely as possible to the frequency, expressed as a percentage, that that level of damage occurred based on accident data. For instance, if a PA resulted in the total destruction of a vehicle in approximately 50% of the cases examined, then approximately 50% of the damage penalties for that problem area are "vehicle destroyed". For training purposes, any vehicle assessed the penalty of "damaged, inoperable" requires evacuation to a maintenance facility and is lost to the unit for 1-3 days.

Injury penalties were expressed in terms of the medical attention required or the number of days the soldier suffering the injury would be lost. The actual average workdays lost for many of the PAs was excessive for the application of penalties in a training environment, and if the penalties were assessed based on actual figures, soldiers would frequently be lost for training for their unit's entire rotation. For instance, AMV excessive speed in 2 1/2 - 5 ton vehicles resulted in an average of 63 lost workdays per injury. Therefore, injury penalties assessed will be for 1, 2, and 3-days only, to make the penalties realistic within the unit's rotation time frame. A 1-day penalty corresponds to actual average lost workdays of 10 or less. A 2-day penalty corresponds to an actual average lost workdays of between 10 and 30, and a 3-day penalty corresponds to actual average lost workday greater than 30. These penalties were applied only for lost workday cases. Any disabling injury penalties also require the assessment of a 3-day penalty. A penalty stating that the soldier was killed implies the soldier is lost for the duration of the exercise.

Damage and injury penalties were listed randomly for each observation since accident severity is a random occurrence. Each penalty list was prefaced with OC guidelines that provided a brief summary of the PA, a definition and an example of the PA, and an explanation of the damage and injury probabilities.

Safety Penalties - Results

The safety penalties and OC guidelines for the selected PAs follow:

Army Motor Vehicle - Excessive Speed

SUMMARY OF AMV ACCIDENTS - EXCESSIVE SPEED

A review of 193 AMV driver error accidents that occurred in SWA during Operation DS/S revealed that nearly 16 percent of the errors committed involved driving too fast (excessive speed). Analysis of injury and damage data from these accidents revealed that excessive speed caused the most injury to soldiers and was the second most important problem area in terms of vehicle/property damage. When injury and damage factors were considered collectively, excessive speed was the most significant problem area among the AMV accident categories during DS/S.

DEFINITION AND EXAMPLES

The problem area of excessive speed is defined by four conditions: (1) excessive speed for road, weather, or visibility conditions, (2) speed in excess of posted or specified limits, (3) speed in excess of the vehicle design/load being carried, and (4) other circumstances for which the vehicle speed was excessive.

An example of condition 1 is the driver's failure to reduce vehicle speed when encountering wet or slippery road surfaces or when encountering reduced visibility from rain, fog, dust, or other conditions. Condition 2 is encountered when the driver exceeds the posted speed limit for the road being traveled or exceeds a set maximum speed limit for a specific set of conditions; e.g. "20 miles per hour (MPH) maximum speed limit for all vehicle operations on tank trails or off-road." Condition 3 exists when the driver exceeds speed limits in the vehicle operator's manual for certain operating conditions or maintains a speed which could, in the event of a sudden turn or stop, cause any cargo or load to shift suddenly. An example of condition 4 is any other circumstance in which a driver maintains a speed that is unsafe for existing conditions; e.g., driving at 20 MPH through a crowded assembly area.

Data examined from DS/S reveals that 87 percent of the accidents caused by excessive speed were caused by the first example, i.e. driving at a speed too fast for road, weather, or visibility conditions.

DAMAGE AND INJURY PROBABILITIES

During development of the safety penalties for excessive speed violations during training exercises, the accident data were separated into three categories: vehicles with less than 2 1/2-ton cargo capacity; cargo vehicles with 2 1/2- to 5-ton capacity, and vehicles with more than 5-ton cargo capacity. Injury to occupants and damage

data were examined separately within each category to ensure that the injury and damage penalties assessed would be appropriate for each vehicle category.

Safety penalties should be assessed based on the following injury and damage data. The characteristics of the violation provide indicators that may be helpful in identifying the violations or errors.

PROBLEM AREA PROFILES AND SAFETY PENALTIES--EXCESSIVE SPEED

When the observer/controller observes and identifies AMV being driven at excessive speed: 1) for road, weather, or visibility conditions, 2) greater than posted or specified limit, 3) that is unsafe for load being carried, or 4) that is unsafe for existing conditions, the following penalties apply. All observations, including those that result in no injury or damage penalty assessment, should be accompanied by an on-the-spot correction by the observer/controller. Injury and damage penalty order was randomly assigned since accident severity is a random occurrence.

Army Motor Vehicle - (<2 1/2-ton capacity)

Characteristics: Most prevalent vehicle--Highly Mobile Maneuverable Wheeled Vehicle (HMMWV); never occurred during convoy operations; usually occurred on paved or dirt roads.

Injury summary: Leading to disability--broken back/neck; Leading to lost workdays--head contusions/concussions, back/neck strains, shoulder dislocations, rib fractures, chest/trunk punctures, knee lacerations.

<u>Typical Injury Profile</u>	<u>Percent</u>	<u>Typical Damage Profile</u>	<u>Percent</u>
Fatality	18	Totally Destroyed	17
Permanent partial disability	5	Damaged and inoperable	25
Lost workday cases	45	Damaged but partly operational	33
First aid only cases	9	Damaged but fully operational	17
No injury	23	No damage	8

<u>Observation #</u>	<u>Injury Penalty</u>	<u>Damage Penalty</u>
1	At least one soldier requires evac to med facility: lost for 2 days	Vehicle damaged, but partly mission capable
2	No injury to soldier(s)	Vehicle damaged, but operational
3	At least one soldier killed	Vehicle destroyed

4	At least one soldier requires evac to med facility; lost for 2 days	Vehicle requires recovery to DS Maint facility; lost for 1 to 3 days
5	At least one soldier requires first aid	Vehicle damaged, but operational
6 and Subsequent	Repeat penalties in order	Repeat penalties in order

Army Motor Vehicle - (2 1/2- to 5-ton capacity)

Characteristics: Most prevalent vehicle--M923 series cargo truck; occurred during convoy operations 38 percent of total instances; usually occurred on dirt roads.

Injury Summary: Leading to lost workdays--head contusions/lacerations, arm contusions/fractures, internal injuries/ruptured spleen.

<u>Typical Injury Profile</u>	<u>Percent</u>	<u>Typical Damage Profile</u>	<u>Percent</u>
Fatality	21	Totally destroyed	50
Lost workday cases	43	Damaged inoperative	40
First-aid-only cases	7	No damage	10
No injury	29		

<u>Observation #</u>	<u>Injury Penalty</u>	<u>Damage Penalty</u>
1	At least one soldier requires evac to med facility; lost for 3 days	Vehicle requires recovery to DS maint facility; lost for 1 to 3 days
2	At least one soldier killed	Vehicle destroyed
3	At least one soldier requires evac to med facility; lost for 3 days	Vehicle requires recovery to DS maint facility; lost for 1 to 3 days
4	No injury to soldier(s)	Vehicle not damaged
5 and Subsequent	Repeat penalties in order	Repeat penalties in order

Army Motor Vehicle - (>5-ton capacity)

Characteristics: Most prevalent vehicle--M-915, -920, and -931 series truck/tractors; most prevalent MOS--88 series; occurred during convoy operations 45 percent of total instances; always occurred on paved or dirt roads.

Injury Summary: leading to lost workdays--head contusions/lacerations, arm contusions/fractures.

<u>Typical Injury Profile</u>	<u>Percent</u>	<u>Typical Damage Profile</u>	<u>Percent</u>
Fatality	13	Totally Destroyed	17
Lost Workday Cases	13	Damaged and Inoperable	5
Restricted Work Activity	7	Damaged but Partly Operational	39
No Injury	67	Damaged but Fully Operational	39

<u>Observation #</u>	<u>Injury Penalty</u>	<u>Damage Penalty</u>
1	No injury to soldier(s)	Vehicle damaged but operational
2	At least one soldier killed	Vehicle destroyed
3	No injury to soldier(s)	Vehicle not damaged
4	At least one soldier requires evac to Med facility; lost for 3 days	Vehicle damaged but partially mission capable
5 and Subsequent	Repeat penalties in order	Repeat penalties in order

Army Motor Vehicle - Following Too Close

SUMMARY OF AMV ACCIDENTS - FOLLOWING TOO CLOSE

A review of 193 AMV driver error accidents that occurred in SWA during Operation DS/S revealed that nearly 22 percent of the errors committed involved following too close. Analysis of injury and damage data from these accidents revealed that following too close caused more damage to AMVs than any other accident category. When injury and damage factors were considered collectively, following too close was the second most significant problem area among AMV accident categories during DS/S.

DEFINITION AND EXAMPLES

The problem area of following too close is defined by three conditions: (1) following too close for environmental and/or road conditions, (2) following too close for vehicle braking ability, and (3) following too close for driver reaction time ability.

An example of condition 1 is the driver's failure to give proper consideration to vehicle speed when encountering wet or slippery road surfaces or when encountering reduced visibility from rain, fog, dust, or other obscured visibility conditions while following another vehicle. Condition 2 is encountered when the driver does not consider his vehicle's load when selecting an interval distance between his vehicle and the preceding vehicle. Condition 3 exists when the driver selects an inadequate interval between his vehicle and the vehicle preceding his vehicle that, despite optimum road and mechanical conditions, a safe stop for the speed being traveled is impossible.

Data examined from DS/S reveals that 53 percent of the accidents caused by following too close were caused by the third example; i.e., following too close for driver reaction time.

DAMAGE AND INJURY PROBABILITIES

When developing the safety penalties for following too close violations during training exercises, the accident data was separated into three categories. These categories were: vehicles with less than 2 1/2-ton cargo capacity; cargo vehicles with 2 1/2- to 5-ton capacity, and vehicles with more than 5-ton cargo capacity. Injury to occupants and damage data were examined separately within each category to ensure that the injury and damage penalties assessed would be appropriate for each vehicle category.

Safety penalties should be assessed based on the following injury and damage data. The characteristics of the violation provide indicators that may be helpful in identifying the violations or errors.

PROBLEM AREA PROFILES AND SAFETY PENALTIES--FOLLOWING TOO CLOSE

When the observer/controller observes and identifies AMV following too close for: 1) environmental and/or road conditions, 2) vehicle braking ability, or 3) driver reaction time ability, the following penalties apply. All observations, including those that result in no injury or damage penalty assessment, should be accompanied by an on-the-spot correction by the observer/controller. Injury and damage penalty order was randomly assigned since accident severity is a random occurrence.

Army Motor Vehicle - (<2 1/2-ton capacity)

Characteristics: Most prevalent vehicle--Commercial Utility Cargo Vehicle (CUCV); only 40 percent occurred during convoy operations; 80 percent occurred on paved roads.

Injury Summary: Two-thirds of all accidents resulted in no injuries; leading to lost workdays--back/neck strains, bruised ribs.

<u>Typical Injury Profile</u>	<u>Percent</u>	<u>Typical Damage Profile</u>	<u>Percent</u>
Lost workday cases	17	Damaged; inoperative	18
First-aid only cases	17	Damaged but partly operational	73
No injury	66	Damaged but fully operational	9

<u>Observation #</u>	<u>Injury Penalty</u>	<u>Damage Penalty</u>
1	At least one soldier requires evac to med facility; lost for 1 day	Vehicle requires recovery to DS maint facility; Lost for 1 to 3 days
2	No injury to soldier(s)	Vehicle operative, but partially mission capable
3	At least one soldier requires first aid	Vehicle operative, but partially mission capable
4	No injury to soldier(s)	Vehicle damaged, but operational
5 and Subsequent	Repeat penalties in order	Repeat penalties in order

Army Motor Vehicle - (2 1/2-5 ton capacity)

Characteristics: Most prevalent vehicle--M923 series cargo truck; occurred during convoy operations in 60 percent of total instances; Eighty percent occurred on paved roads.

Injury Summary: Seventy percent of all accidents resulted in no injuries; Leading to lost workdays - head concussions/ lacerations, back contusions.

<u>Typical Injury Profile</u>	<u>Percent</u>	<u>Typical Damage Profile</u>	<u>Percent</u>
		No Damage	17
Lost workday cases	30	Damaged and inoperable	6
No injury	70	Damaged but partly operational	44
		Damaged but fully operational	33

<u>Observation #</u>	<u>Injury Penalty</u>	<u>Damage Penalty</u>
1	No injury to soldier(s)	Vehicle not damaged
2	No injury to soldier(s)	Vehicle operative, but partially mission capable
3	No injury to soldier(s)	Vehicle damaged, but operational
4	At least 1 soldier requires evac to Med facility; lost for 1 day	Vehicle requires recovery to DS Maint facility; lost for 1 to 3 days
5 and Subsequent	Repeat penalties in order	Repeat penalties in order

ARMY MOTOR VEHICLE -- (>5 ton capacity)

Characteristics: Most prevalent vehicle--M915 series truck/tractors; most prevalent MOS--88 series; occurred during convoy operations in 52 percent of total instances; 64 percent occurred on paved roads.

Injury Summary: Leading to lost workdays--head lacerations, knee contusions/edema, neck sprain.

<u>Typical Injury Profile</u>	<u>Percent</u>	<u>Typical Damage Profile</u>	<u>Percent</u>
Lost workday cases	15	Totally Destroyed	3
First-aid only	4	Damaged and inoperable	18
No injury	81	Damaged but partly operational	47
		Damaged but fully operational	32

<u>Observation #</u>	<u>Injury Penalty</u>	<u>Damage Penalty</u>
1	No injury to soldier(s)	Vehicle damaged, but operational
2	At least one soldier requires evac to med facility; lost for 1 day	Vehicle requires recovery to DS maint facility; lost for 1 to 3 days
3	No injury to soldier(s)	Vehicle operative, but partially mission capable
4	No injury to soldier(s)	Vehicle operative, but partially mission capable
5 and Subsequent	Repeat penalties in order	Repeat penalties in order

Army Combat Vehicle - Lack of Crew Coordination or Communication

SUMMARY OF ACV ACCIDENTS DUE TO LACK OF CREW COORDINATION OR COMMUNICATION

A review of 29 ACV crew error accidents that occurred in SWA during Operation DS/S revealed that nearly 25 percent of the errors committed involved lack of crew coordination or communication. Analysis of injury and damage data from these accidents revealed that inadequate crew coordination or communication caused more injury to ACV crew members than any other accident category.

DEFINITION AND EXAMPLES

The problem area of inadequate crew coordination/ communication is defined by 5 conditions: (1) improper action sequence, (2) failure to offer assistance, information, or a warning requested or needed by another crewmember(s), (3) lack of positive communication using standard terminology with specific qualifiers, (4) failure to announce a decision or action that affects other crewmembers' duties, and (5) failure to direct or request assistance from other crewmember(s).

An example of condition 1 is the driver initiating vehicle movement before receiving the vehicle commander's order to do so. Condition 2 is encountered when the driver or vehicle commander fails to warn the remaining crew of an impending hazard such as unusually rough terrain or a large, overhanging branch. Condition 3 exists when the vehicle commander fails to confirm that all crewmembers are clear prior to traversing the turret. An example of condition 4 is when a crewmember fails to announce to the driver or vehicle commander his decision to dismount the vehicle during a momentary halt. An example of condition 5 is the vehicle commander failing to direct a crewmember to dismount and act as a ground guide when necessary due to close quarters or visibility restrictions.

Data examined from DS/S reveals that 57 percent of the accidents caused by inadequate crew coordination/communication were caused by condition 4; i.e., failure to announce a decision or action that affects other crewmembers' duties.

DAMAGE AND INJURY PROBABILITIES

During development of the safety penalties for inadequate crew coordination or communication violations during training exercises, injury to occupants and damage data from DS/S accident cases were examined to ensure that the assessed injury and damage penalties would be appropriate for each occurrence.

Safety penalties should be assessed based on the following injury and damage data. The characteristics of the violation provide indicators that may be helpful in identifying the violations or errors.

PROBLEM AREA PROFILES AND SAFETY PENALTIES
INADEQUATE CREW COORDINATION/COMMUNICATION--ARMY COMBAT VEHICLE

When the observer/controller observes and identifies an ACV crewmember: (1) initiating an improper action sequence, (2) failing to offer assistance, information, or a warning requested or needed by another crewmember, (3) not communicating positively using standard terminology with specific qualifiers, (4) failing to announce a decision or action that affects other crewmembers' duties, and (5) failing to direct or request assistance from other crewmember(s), the following penalties apply. All observations, including those that result in no injury or damage penalty assessment, should be accompanied by an on-the-spot correction by the observer/controller. Injury and damage penalty order was randomly assigned since accident severity is a random occurrence.

Army Combat Vehicle Crew Error - Inadequate Crew Coordination/Communication

Characteristics: Most prevalent Vehicle--M1A1 Tank; no occurrences during convoy operations; over half of the occurrences involved a crewmember's failure to announce a decision or action.

Injury Summary: 70 percent of all injuries resulted in either permanent partial disabilities or lost workdays; typical injuries leading to lost workdays--fractures of hip, knee, skull, ribs; head contusions/concussions.

<u>Typical Injury Profile</u>	<u>Percent</u>	<u>Typical Damage Profile</u>	<u>Percent</u>
Permanent partial disability	10	Damaged; inoperative	14
Lost workday cases	60	Vehicle not damaged	86
First-aid only cases	10		
No injury	20		

<u>Observation #</u>	<u>Injury Penalty</u>	<u>Damage Penalty</u>
1	At least one soldier requires evac to Med facility; lost 3 days	Vehicle not damaged
2	No injury to soldier(s)	Vehicle not damaged
3	At least one soldier requires first aid	Vehicle not damaged
4	At least one soldier requires evac to med facility; lost for 3 days	Vehicle requires recovery to DS maint facility; lost for 1 to 3 days

5	At least one soldier requires evac to med facility; lost for 3 days	No damage to vehicle
6 and Subsequent	Repeat penalties in order	Repeat penalties in order

Army Combat Vehicle Accidents Due to Excessive Speed

SUMMARY

A review of 29 ACV crew error accidents that occurred in SWA during Operation DS/S revealed that nearly 14 percent of the errors committed involved driving too fast (excessive speed). Analysis of injury and damage data from these accidents revealed that excessive speed was the most significant problem area in terms of vehicle/property damage. Additionally, 75 percent of the accidents involving excessive speed resulted in injuries leading to lost workdays.

DEFINITION AND EXAMPLES

The problem area of excessive speed is defined by four conditions: (1) excessive speed for road, weather, or visibility conditions, (2) speed in excess of posted or specified limits, and (3) speed in excess of the vehicle design/load being carried, and (4) other circumstances for which the vehicle speed was excessive.

An example of condition 1 is failure to reduce vehicle speed when encountering wet or slippery road surfaces or when encountering reduced visibility from rain, fog, dust, or other restrictions to visibility. Condition 2 is encountered when the posted speed limit for the road being traveled is exceeded or when the maximum speed limit is exceeded for a specific set of conditions; e.g., "20 (MPH) maximum speed limit for all vehicle operations on tank trails or off-road." Condition 3 exists when any speed limit in the vehicle operator's manual for specific operating conditions is exceeded. An example of condition 4 is any other circumstance in which a driver maintains a speed that is unsafe for existing conditions; e.g., driving at 20 MPH through a crowded assembly area.

Data examined from DS/S reveals that all of the ACV accidents caused by excessive speed were caused by the first example; i.e., driving at a speed too fast for road, weather, or visibility conditions.

DAMAGE AND INJURY PROBABILITIES

When developing the safety penalties for excessive speed violations during training exercises, injury to occupants and damage data from DS/S accident cases were examined to ensure that the injury and damage penalties assessed would be appropriate for each occurrence.

Safety penalties should be assessed based on the following injury and damage data. The characteristics of the violation provide indicators that may be helpful in identifying the violations or errors.

PROBLEM AREA PROFILES AND SAFETY PENALTIES
EXCESSIVE SPEED--ARMY COMBAT VEHICLE

When the OC observes and identifies ACV being driven at excessive speed: (1) for road, weather, or visibility conditions, (2) greater than posted or specified limit, (3) that exceeds a speed limit specified in the operator's manual, or (4) that is unsafe for existing conditions, the following penalties apply. All observations, including those that result in no injury or damage penalty assessment, should be accompanied by an on-the-spot correction by the observer/controller. Injury and damage penalty order was randomly assigned since accident severity is a random occurrence.

Army Combat Vehicle Crew Error-Excessive Speed

Characteristics: Most prevalent vehicle--Carriers; 75 percent of occurrences were off-road; 50 percent occurred during convoy operations.

Injury Summary: 80 percent of all injuries resulted in lost workdays; typical injuries leading to lost workdays--fractures of fingers, hands; head/mouth contusions; back contusions.

<u>Typical Injury Profile</u>	<u>Percent</u>	<u>Typical Damage Profile</u>	<u>Percent</u>
Lost workday cases	80	Damaged but partly operational	40
No injury	20	Damaged but fully operational	20
		Vehicle not damaged	40

<u>Observation #</u>	<u>Injury Penalty</u>	<u>Damage Penalty</u>
1	At least one soldier requires evac to med facility; lost for 2 days	Vehicle not damaged
2	At least one soldier requires evac to med facility; lost for 2 days	Vehicle damaged, but partially mission capable
3	At least one soldier requires evac to med facility; lost for 2 days	Vehicle damaged, but operational
4	No injury to soldier	Vehicle not damaged
5	At least one soldier requires evac to Med facility; lost for 2 days	Vehicle damaged, but partially mission capable
6 and Subsequent	Repeat penalties in order	Repeat penalties in order

Army Combat Vehicle Crew Error Accidents Due to Inadequate Inspection or Check

SUMMARY

A review of 29 ACV crew error accidents that occurred in SWA during Operation DS/S revealed that nearly 18 percent of the errors committed involved crewmembers performing inadequate inspections or checks of their stations/vehicles. Analysis of injury data from these accidents revealed that the error inadequate inspection or check led to injuries resulting in either a permanent partial disability or a lost workday in all occurrences.

DEFINITION AND EXAMPLES

The problem area of inadequate inspection or check can be committed by any crewmember in the vehicle and can occur before, during, or after operation. The most typical instance of inadequate inspection or check in the accident sample reviewed involved personal injuries resulting from unsecured hatches; 60 percent of all the occurrences involved the lack of before-operation checks.

DAMAGE AND INJURY PROBABILITIES

When developing the safety penalties for inadequate crew inspection or check violations during training exercises, injury data from DS/S accident cases were examined to ensure that the injury penalties assessed would be appropriate for each occurrence. There were no cases involving vehicle damage within this problem area.

Safety penalties should be assessed based on the following injury data. The characteristics of the violation provide indicators that may be helpful in identifying the violation or error.

PROBLEM AREA PROFILES AND SAFETY PENALTIES INADEQUATE INSPECTION OR CHECK--ARMY COMBAT VEHICLE

When the observer/controller observes and identifies an ACV crewmember not performing an adequate inspection or check of his vehicle or station before, during, or after operation, the following penalties apply. All observations, including those that result in no injury penalty assessment, should be accompanied by an on-the-spot correction by the observer/controller. Injury penalty order was randomly assigned since accident severity is a random occurrence.

Army Combat Vehicle Crew Error - Inadequate Inspection or Check

Characteristics: 60 percent of occurrences were off-road; No occurrences during convoy operations; 60 percent involved inadequate inspection or check before operation.

Injury Summary: All injuries resulted in either permanent partial disabilities or lost workdays; typical injuries leading to lost workdays--fractures of fingers, hands, ankles; head/mouth contusions; typical injury leading to permanent partial disabilities--finger amputation.

<u>Typical Injury Profile</u>	<u>Percent</u>	<u>Typical Damage Profile Percent</u>
Permanent partial disability	20	Vehicle not damaged 100
Lost workday cases	80	
<u>Observation #</u>	<u>Injury Penalty</u>	<u>Damage Penalty</u>
1	At least one soldier requires evac to med facility; lost for 2 days	Vehicle not damaged
2	At least one soldier requires evac to med facility; lost for 3 days	Vehicle not damaged
3	At least one soldier requires evac to med facility; lost for 2 days	Vehicle not damaged
4	At least one soldier requires evac to med facility; lost for 2 days	Vehicle not damaged
5 and Subsequent	Repeat penalties in order	Repeat penalties in order

Personal Injury Accidents - Weapons Handling

SUMMARY

A review of 245 personal injury accidents that occurred in SWA during Operation DS/S revealed that nearly 29 percent of the errors committed involved soldiers performing weapons handling activities. Of the weapons handling accidents, 34 percent involved improper clearing, and 14 percent involved unauthorized use or handling of simulators, pyrotechnics, Hoffman devices, ATWESS, etc. Analysis of injury data from these accidents revealed that improper clearing resulted in a total of 534 lost workdays, an average of 26.7 lost workdays per lost workday case. Improper clearing also resulted in two permanent partial disabilities, and two fatalities. Unauthorized use or handling of simulators, pyrotechnics, Hoffman devices, ATWESS, etc., resulted in 293 lost workdays, an average of 29.3 lost workdays per lost workday case.

DEFINITION

Weapons handling errors include two observable error categories. The first error category is the unauthorized use or handling of any pyrotechnic devices including flares, simulators, Hoffman devices, ATWESS, ammunition, or munitions. The second category of weapons handling error is the improper clearing of rifles, pistols, or machineguns while disarming or unloading or prior to assembling, cleaning, or disassembling.

DAMAGE AND INJURY PROBABILITIES

When developing the safety penalties for weapons handling accidents, injury data from DS/S accident cases were examined to ensure that the injury penalties assessed would be appropriate for each occurrence.

Safety penalties should be assessed based on the following injury data. The characteristics of the violation provide indicators that may be helpful in identifying the violations or errors.

WEAPONS HANDLING PROBLEM AREA PROFILES AND SAFETY PENALTIES

Personal Injury - Improper Clearing

When the OC observes and identifies a soldier improperly clearing his weapon or failing to clear his weapon, the following penalties apply. All observations should be accompanied by an on-the-spot correction by the observer/controller. Injury penalty order was randomly assigned since accident severity is a random occurrence.

Characteristics: 58 percent of the occurrences involve personal sidearms, 34 percent involved M16 rifles, 8 percent involved M60 machineguns; in 75 percent of the occurrences, the person committing the error wounded himself.

Injury Summary: 8 percent of the occurrences resulted in a fatality, and likewise, 8 percent also resulted in a permanent partial disability; 84 percent of the errors caused injuries resulting in lost workdays averaging over 24 lost workdays per injury; 100 percent of the fatalities were caused by a soldier shooting another soldier; all of the injuries were judged to have required immediate medical evacuation.

<u>Typical Injury Profile</u>	<u>Percent</u>	<u>Observation #</u>	<u>Injury Penalty</u>
Fatality	8	1	Soldier requires immediate evac to Med facility; lost for 2 days
Permanent Partial Disability	8		
Lost Workday Cases	84	2	Soldier requires immediate evac to med facility; lost for 2 days
		3	Soldier is killed
		4	Soldier requires immediate evac to med facility; lost for 2 days
		5 and Subsequent	Repeat penalties in order

Personal Injury - Unauthorized Use and Handling

When the observer/controller observes and identifies a soldier attempting to open, carry, manipulate, probe, or otherwise handle, without authorization, pyrotechnical devices of any kind, the following penalties apply. All observations should be accompanied by an on-the-spot correction by the OC. Injury penalty order was randomly assigned since accident severity is a random occurrence.

Characteristics: Accident reports reveal no commonalities among occurrences.

Injury Summary: Lost workdays averaged nearly 27 per lost workday case; 23 percent of the injuries were incurred by bystanders; 77 percent of the injuries were judged to have required immediate medical evacuation.

<u>Typical Injury Profile</u>	<u>Percent</u>	<u>Observation #</u>	<u>Injury Penalty</u>
First-aid only cases	15	1	Soldier requires immediate evac to med facility; lost for 2 days
Lost workday cases	85	2	Soldier ceases activity; requires non-urgent med treatment; lost for 2 days
		3	Soldier requires immediate evac to med facility; lost for 2 days
		4 and Subsequent	Repeat penalties in order

Personal Injury Accidents - Materiel Handling

SUMMARY

A review of 245 personal injury accidents that occurred in SWA during Operation DS/S revealed that nearly 36 percent of the errors committed involved soldiers performing materiel handling activities. Of the materiel handling accidents, 22 percent involved improper technique, and 13 percent involved soldiers taking inadequate precautions for environmental hazards. Analysis of injury data from these accidents revealed that improper technique resulted in a total of 235 lost workdays, an average of 13.06 lost workdays per lost workday case. Taking inadequate precautions for environmental conditions resulted in a total of 62 lost workdays, an average of 5.64 lost workdays per lost workday case.

DEFINITION

Improper technique includes two observable materiel handling error categories. The first error category includes not using the proper method when lifting or lowering objects or materiel. The recognized proper method requires feet spread comfortably apart and beneath the body, back straight while lifting or lowering the materiel with the legs by bending at the knees, and the load drawn close to the body with arms and elbows tucked into the sides. Object should be lifted or lowered gradually, avoiding jerky or twisting motions. The second category of improper technique is an individual attempting to handle materiel of excessive weight or size without requesting assistance. Inadequate precautions for environmental hazards include disregard of the effects of hazardous conditions caused by environmental phenomena such as high winds, extreme heat, rain, sleet, snow, etc., while handling the materiel.

DAMAGE AND INJURY PROBABILITIES

When developing the safety penalties for materiel handling accidents, injury data from DS/S accident cases were examined to ensure that the injury penalties assessed would be appropriate for each occurrence.

Safety penalties should be assessed based on the following injury data. The characteristics of the violation provide indicators that may be helpful in identifying the violations or errors.

MATERIEL HANDLING PROBLEM AREA PROFILES AND SAFETY PENALTIES

Personal Injury - Improper Technique

When the observer/controller observes and identifies a soldier handling materiel and using improper technique, the following penalties apply. All observations should be accompanied by an on-the-spot correction by the observer/controller. Injury penalty order was randomly assigned since accident severity is a random occurrence.

Characteristics: Typical objects handled include sandbags, pallets, and boxes or cartons; 84 percent occurred in the field versus in warehouses or storage facilities.

Injury Summary: 94 percent of the errors caused injuries resulting in lost workdays averaging over 13 lost workdays per injury; nearly one-third of the injuries were judged to have required immediate medical evacuation; typical injuries leading to lost workdays--back strains, hernias, and contusions and lacerations of the lower extremities.

<u>Typical Injury Profile</u>	<u>Percent</u>	<u>Observation #</u>	<u>Injury Penalty</u>
Permanent partial disability	6	1	Soldier ceases activity, requires non-urgent med treatment, lost for 2 days
Lost workday cases	94	2	Soldier requires immediate evac to med facility; lost for 3 days
		3	Soldier ceases activity, requires non-urgent med treatment, lost for 2 days
		4 and Subsequent	Repeat penalties in order

Personal Injury - Inadequate Precautions for Environmental Hazards

When the observer/controller observes and identifies a soldier handling materiel and taking inadequate precautions for environmental hazards, the following penalties apply. All observations should be accompanied by an on-the-spot correction by the observer/controller. Injury penalty order was randomly assigned since accident severity is a random occurrence.

Characteristics: 55 percent occurred while soldier was off-loading a vehicle; 82 percent occurred in the field versus warehouses or storage facilities.

Injury Summary: Lost workdays injuries averaged nearly 6 lost workdays per injury; 45 percent of the injuries were judged to have required immediate medical evacuation; typical injuries leading to lost workdays--heat injuries, trunk and rib contusions, clavicle and wrist fractures, shoulder dislocations.

<u>Typical Injury Profile</u>	<u>Percent</u>	<u>Observation #</u>	<u>Injury Penalty</u>
Lost workday cases	100	1	Soldier requires immediate evac to med facility; lost for 1 day
		2	Soldier ceases activity, requires non-urgent med treatment, lost for 1 day
		3	Soldier ceases activity, requires non-urgent med treatment; lost for 1 day
		4 and Subsequent	Repeat penalties in order

Personal Injury Accidents - Maintenance

SUMMARY

A review of 245 personal injury accidents that occurred in SWA during Operation DS/S revealed that nearly 34 percent of the errors committed involved soldiers performing maintenance activities. Of the maintenance accidents, 33 percent involved improper use of tools or equipment. Analysis of injury data from these accidents revealed that improper use of tools and equipment resulted in a total of 297 lost workdays, an average of 11 lost workdays per injury.

DEFINITION

Improper use of tools and equipment includes three observable maintenance error categories. The first error category includes using hand tools improperly or not using the proper hand tool even though it was required and available. The second category includes the improper use of a jack, lift, or hoist. The third category is failing to use protective clothing and equipment when required and available.

DAMAGE AND INJURY PROBABILITIES

When developing the safety penalties for maintenance accidents, injury data from DS/S accident cases were examined to ensure that the injury penalties assessed would be appropriate for each occurrence.

Safety penalties should be assessed based on the following injury data. The characteristics of the violation provide indicators that may be helpful in identifying the violations or errors.

MAINTENANCE PROBLEM AREA PROFILES AND SAFETY PENALTIES

Personal Injury - Improper Use of Hand Tools

When the OC observes and identifies a soldier using hand tools improperly or not using the right tool, the following penalties apply. All observations should be accompanied by an on-the-spot correction by the observer/controller. Injury penalty order was randomly assigned since accident severity is a random occurrence.

Characteristics: 50 percent of the errors involved using the correct tool improperly; 57 percent of the errors occurred during wheeled- and tracked-vehicle maintenance.

Injury Summary: All of the errors caused injuries resulting in lost workdays averaging over 7 lost workdays per injury; 36 percent of the injuries were judged to have required immediate medical evacuation; typical injuries leading to lost workdays-- hand/arm punctures, thumb/finger/nose fractures, finger/thumb/ face/ and eye lacerations; electrical shock.

<u>Typical Injury Profile</u>	<u>Percent</u>	<u>Observation #</u>	<u>Injury Penalty</u>
Lost workday cases	100	1	Soldier ceases activity; requires non-urgent med treatment; lost for 1 day
		2	Soldier requires immediate evac to med facility; lost for 1 day
		3	Soldier ceases activity; requires non-urgent med treatment; lost for 1 day
		4 and Subsequent	Repeat penalties in order

Personal Injury - Improper Use of Jacks, Lifts, and Hoists

When the observer/controller observes and identifies a soldier improperly using a jack, lift or hoist, the following penalties apply. All observations should be accompanied by an on-the-spot correction by the observer/controller. Injury penalty order was randomly assigned since accident severity is a random occurrence.

Characteristics: All errors occurred during wheeled vehicle maintenance; all errors occurred in wheeled vehicle maintenance facilities.

Injury Summary: Lost workdays injuries averaged nearly 3 lost workdays per injury; 33 percent of the injuries were judged to have required immediate medical evacuation; 33 percent of the

injuries resulted in permanent partial disabilities; typical injuries leading to lost workdays - head, hand lacerations.

<u>Typical Injury Profile</u>	<u>Percent</u>	<u>Observation #</u>	<u>Injury Penalty</u>
Permanent Partial Disability	33	1	Soldier requires immediate evac to Med facility; lost for 3 days
Lost workday cases	67	2	Soldier ceases activity, requires non-urgent med treatment; lost for 1 day
		3	Soldier ceases activity, requires non-urgent med treatment; lost for 1 day
		4 and Subsequent	Repeat penalties in order

Personal Injury - Failure to Use Protective Clothing or Equipment

When the observer/controller observes and identifies a soldier failing to use protective clothing and equipment when it is required and available, the following penalties apply. All observations should be accompanied by an on-the-spot correction by the observer/controller. Injury penalty order was randomly assigned since accident severity is a random occurrence.

Characteristics: 50 percent of the errors occurred during wheeled- or tracked-vehicle maintenance; only 40 percent of the errors occurred in wheeled-vehicle maintenance facilities, with the remaining 60 percent occurring in the field; 60 percent of the errors involved failure to use eye protection.

Injury Summary: Lost workdays injuries averaged nearly 19 lost per injury; 70 percent of the injuries were judged to have required immediate medical evacuation; typical injuries leading to lost workdays--eye perforations, chemical burns, skull fracture, hand lacerations.

<u>Typical Injury Percent</u>	<u>Percent</u>	<u>Observation #</u>	<u>Injury Penalty</u>
Lost workday cases	100	1	Soldier requires immediate evac to med facility; lost for 2 days
		2	Soldier requires immediate evac to med facility; lost for 2 days
		3	Soldier ceases activity; requires non-urgent med treatment; lost for 2 days
		4 and Subsequent	Repeat penalties in order

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CONCLUSIONS:

There is a lack of formal doctrine specifying the duties, responsibilities, and functions of civilian safety personnel in a combat theater of operations through all the phases of contingency operations. This doctrinal shortcoming occurs both in the cornerstone of the Army Safety Program, AR 385-10, in Accident Reporting and Investigation, AR 385-40, and in associated field manuals which depict the functions of the staff in combat. The lack of combat safety doctrine not only makes it difficult for the civilian safety professional to perform useful specific tasks, but it also fails to provide the commander with an awareness of the utility of an effective safety program in combat.

Safety problem areas which occur in a combat theater are not necessarily the same safety problems that are identified by OCS at Army CTCs. The review of safety observations from the NTC during FY 89 revealed there were no observations pertaining to basic safety considerations with individual weapons. Yet, during DS/S, improper clearing of individual weapons caused many injuries. It is surmised that the lack of this type of observation stems from the fact that no live ammunition is issued to soldiers nor are individual weapons loaded at the CTCs except during tightly controlled live fire exercises. Therefore, OCS have no reason to observe individual weapon safety procedures since the weapons are always "safe"; i.e., not loaded. Improper techniques for materiel handling caused many injuries during DS/S, yet there were no observations of this PA mentioned by exercise OCS in FY 1989. OCS likely do not consider the evaluation of lifting, carrying, etc., techniques as part of the exercise or, they may not recognize the improper techniques that could lead to injury should they see them.

In order to effectively integrate safety into training at the Army CTCs, commanders must be aware of the consequences of unsafe acts. If faced with a potential loss of combat power due to accidental loss of soldiers and equipment during the exercise, commanders would be more likely to utilize risk management techniques to reduce or eliminate the potential loss. If commanders learn to use these techniques during training and realize that they can enhance their unit's combat power, they will also be likely to use the techniques in actual combat.

RECOMMENDATIONS:

Recommend the USASC develop appropriate doctrinal input to, as a minimum, AR 385-10, AR 385-40, and FM 101-5, delineating reasonable and practical safety functions for application in a combat theater. Potential safety functions which could be integrated into the doctrine include those developed by this study (pages 10-18).

Train exercise OCs to identify safety problem areas with low observability/high importance ratings. Training should include, but not be limited to, individual weapons handling, and proper techniques for materiel handling. Actual DS/S accident data should be used in this training to include review of specific accident cases to familiarize the OCs with the wide range and variety of accident causes.

Safety penalty candidates should be developed and integrated into the rules of engagement for the CTCs. The rules of engagement should provide for the assessment of safety penalties consistent with the likelihood of injury/damage (importance) associated with those problem areas. Safety penalty candidates should be developed for the safety problem areas with the highest importance rating for application during exercises at the Army CTC's. Problem areas selected for safety penalty candidates should have a relatively high observability rating (between 1.00 and 2.00 is optimum) unless OCs are trained to identify less obvious problem areas.

APPENDIX A

INTERVIEW GUIDE

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INTERVIEW GUIDE

BACKGROUND INFORMATION

1. Name _____
2. Grade _____
3. Current Position/Command _____ / _____
4. Position during DS/S _____
5. Number of Years Experience as Army Safety Professional _____
6. Previous Experience in Army Safety Capacity during Armed Conflicts

No. of Days/Months <u>Involved w/Planning</u>	No. of Days/Months <u>Involved w/Planning</u>	
Desert Shield/Storm	_____	
Just Cause	_____	
Urgent Fury	_____	
Vietnam	_____	
7. Mailing Address	_____	
8. Duty Telephone #	DSN	<u>COMMERCIAL</u>

QUESTIONS PERTAINING TO THE SIX CONTINGENCY PHASES:

(Please answer the following questions based on your experience with Desert Shield/Storm).

PEACETIME PLANNING PHASE -- The peacetime/garrison environment before notification by the NCA that your command will participate in a specific contingency operation.

1. Describe the command climate for safety prior to DS/S.
2. Were your command's go-to-war plans adequate from the point of view that essential safety functions/tasks were considered and addressed?
3. Did existing pre-contingency plans within your command contain any input or guidance from the command's safety manager pertaining to essential safety functions/tasks?
4. Did you, in your capacity as the command safety manager/safety professional, ever have the opportunity to review your command's go-to-war plans with the objective of evaluating them from a safety perspective and integrating essential safety considerations?
5. What input from the command safety manager do you think is necessary in the pre-contingency planning phase to integrate into the planning process?
6. What specific safety items need to be addressed in pre-contingency planning documents?
7. Are there any specific safety tasks accomplished routinely in garrison that have no effective applications in a combat environment? Are there any specific tasks that are necessary, but should be accomplished differently?
8. Are there tactical training safety tasks accomplished by your organization in peacetime that have no effective application or should be accomplished differently in combat?
9. Who (military or civilian) within your command exercises direct supervisory responsibility over the command safety manager?
10. In your opinion, other than providing information for input into planning documents, in what other specific areas can the safety manager/professional make the most significant impact in preparing for contingencies?

Possible safety applications include:

- a. Integrate safety into individual/unit training.
- b. Provide risk assessment of geographical/environmental considerations of most likely contingency area.
- c. Prepare safety staff for deployment; consider individual training and required equipment support.

PREDEPLOYMENT PHASE -- The phase that begins after notification by the NCA and includes all preparation done prior to deployment.

1. Describe the command climate for safety during this phase. Had it changed from the previous phase?
2. What were your most significant problems after your command was notified that elements would deploy in support of Operation DS/S?
3. What safety activities did you consider the most essential during the predeployment phase? The least essential?
4. As you assisted the personnel in your command in preparing for deployment, were there any specific safety-related functions that you or your staff were required to perform for which you were particularly unprepared?
5. Describe the type of safety support that was provided to Reserve Component forces mobilized at your location.
6. Describe the specific safety functions or tasks that you most frequently performed during this phase.

Possible safety applications include:

- a. Integrate safety into pre-operations individual/unit training.
- b. Provide risk assessment of geographical/environmental considerations of selected contingency area.
- c. Prepare safety staff for deployment; consider individual training and required equipment support.
- d. Inspect/evaluate safety related activities of deploying units.

- e. Monitor loading of equipment at home station.
- f. Begin accident investigation (condensed format).

DEPLOYMENT PHASE--The phase characterized by the movement of forces, including their transport to railhead, port, etc., loading, transport to the contingency area, occupying the contingency area, unloading, and movement to combat positions.

1. Describe the command climate for safety during this phase. Had it changed from the previous phase?
2. What safety activities did you consider the most essential during the deployment phase? The least essential?
3. If you or your staff monitored vehicle and equipment loading at railheads and ports, did you have enough technical expertise to provide adequate risk assessment or management during the loading operations?
4. During the deployment of personnel and equipment from your command, were there any specific safety related functions that you or your staff were required to perform for which you were particularly unprepared?
5. Describe the specific safety functions or tasks that you most frequently performed during this phase.

Possible safety applications include:

- a. Conduct risk assessment of logistical support bases in lodgment area.
- b. Conduct risk assessment of materiel handling and transportation requirements in CSS units.
- c. Continue monitoring equipment off loading at POE into the lodgment area.
- d. Inspect/evaluate safety related activities of deployed units.
- e. Continue accident investigation (condensed format).
- f. Provide Safety Estimate of the situation.

6. In relation to the movement of your unit, when did you deploy? Were you in the TPFDD? When should safety personnel deploy?
7. What problems did you experience personally during deployment?

8. What equipment did you have available in SWA? What equipment should you have had?

9. Once you deployed, was adequate safety support available to your garrison/activity?

FORCE BUILDUP PHASE--The phase that includes the continued arrival, unloading, and movement of additional combat, CS, and CSS personnel and equipment to the contingency area.

1. Describe the command climate for safety during this phase. Had it changed from the previous phase?
2. What safety activities did you consider the most essential during the force buildup phase? The least essential?
3. During this phase, were there any specific safety related functions that you or your staff were required to perform for which you were particularly unprepared?
4. Describe any problems you may have experienced with safety communication?
5. Describe the specific safety functions or tasks that you most frequently performed during this phase.

Possible safety applications include:

- a. Continue risk assessment of logistical support bases in lodgment area.
- b. Continue risk assessment of materiel handling and transportation requirements in CSS units.
- c. Continue to inspect/evaluate safety related activities of deployed units.
- e. Continue accident investigation (condensed format).
- f. Collect data and provide status reports.
- g. Conduct preliminary hazard analysis of non-hostile risks.
- h. Provide commander with assessment of most significant risks.

DECISIVE COMBAT ACTIONS PHASE--The phase during which AirLand Battle doctrine is employed, using the maximum combat power available to the theater commander, in order to destroy the enemy's center of gravity and obtain a decisive victory.

1. Describe the command climate for safety during this phase. Had it changed from the previous phase?
2. What safety activities did you consider the most essential during the decisive combat action phase? The least essential?
3. What role did you play during the decisive combat action phase?
4. What specific safety function(s) can be applied to reduce non-hostile losses during this phase?
5. During this phase, were there any specific safety related functions that you or your staff were required to perform for which you were particularly unprepared?
6. Describe problems you may have experienced with safety communications.
7. Describe the specific safety functions or tasks that you most frequently performed during this phase.

Possible safety applications include:

- a. Continue risk assessment of logistical support bases in lodgment area.
- b. Continue risk assessment of materiel handling and transportation requirements in CSS units.
- c. Continue to inspect/evaluate safety related activities of deployed units.
- d. Continue accident investigation (condensed format).
- e. Continue to collect data and provide status reports.
- f. Continue to conduct preliminary hazard analysis of non-hostile risks.
- g. Continue to monitor trends and apply appropriate countermeasures.

REDEPLOYMENT PHASE--The phase during which forces reconstitute, regroup, move to redeployment points, load, and return to home base.

1. Describe the command climate for safety during this phase. Had it changed from the previous phase?
2. What safety activities did you consider the most essential during the redeployment phase? The least essential?
3. During this phase, were there any specific safety related functions that you or your staff were required to perform for which you were particularly unprepared?
4. Describe problems you may have experienced with safety communications.
5. Describe the specific safety functions or tasks that you most frequently performed during this phase.

Possible safety applications include:

- a. Review redeployment plans, load plans, etc.
- b. Compile statistics reflecting pertinent rates and trends of the operation.
- c. Prepare initial safety after action report/lessons learned.
- d. Continue risk assessment of materiel handling and transportation requirements in CSS units.
- e. Continue to inspect/evaluate safety-related activities of deployed units.
- f. Continue to monitor trends and apply appropriate countermeasures.
- g. Prepare safety staff for redeployment.

GENERAL QUESTIONS

1. Are you familiar with the Army's how-to-fight doctrine? If you are, do you feel the safety function should be integrated into the doctrine, and if so, how?
2. How would you characterize the difference between the wartime safety mission and peacetime safety mission of your command?
3. Does your command safety office have a wartime METL? If it does, how does it differ from peacetime priorities?
4. State (or paraphrase) the primary objective of your command's safety office in a combat environment.
5. What were the five biggest safety problems you encountered during DS/S?
6. In your opinion, can civilian safety professionals adequately support the Army during contingency operations?
7. In your opinion, what changes must be made to ensure the effectiveness of the Army Safety Program in contingency operations?

Topics for telephonic interviews with the USAF, USN, & USMC

1. Describe the organizational structure in your service for implementing accident prevention plans, programs, and policies at different levels of command.

(Key items: Are safety personnel civilian or military? Are the personnel who are performing safety duties full-time safety personnel or are they collateral duty safety personnel? Are different safety functions (e.g., explosive safety, vehicle safety, aviation safety, accident investigation) performed by separate personnel/specialists?)

2. Within a "typical" combat organization, where in the commander's staff is the safety function slotted?

(Key items: Who has supervisory responsibility for the safety person? What is the safety person's relationship with the remainder of the staff? In what key staff functions does the safety person participate?)

3. Do the manuals/directives/regulations that establish your service's safety program and specify the duties of safety personnel provide guidance pertaining to the duties and responsibilities of safety personnel in a combat environment?

(Key items: If yes, what duties are specified for combat theaters? How do they differ from the duties that are routinely performed in a garrison/peacetime environment? Do the manuals/directives/regulations modify any procedures so they may be performed more expeditiously in a combat environment? What are those procedures?)

If no, should there be duties specified for safety personnel that would pertain to a combat theater? What duties would be appropriate? What are the safety activities in a combat environment?)

4. Is "safety" (safety-related tasks performed by safety professionals or collateral duty safety personnel) integrated into or referred to in your service's how-to-fight manuals and doctrine?

(Key items: If yes, is it addressed as a separate, but equal component of the doctrine, or is it interwoven throughout the doctrine? Would you describe its tone as "philosophical" or "procedural"? Are there any specific safety tasks or procedures listed or mentioned in the doctrine? If no, why not? Do safety tasks and functions belong in how-to-fight doctrine?)

5. To what degree are safety-related tasks and functions integrated into the planning documents that prepare your service for contingencies?

(Key items: Were the safety personnel deployed initially during DS/S or did they "infiltrate" the theater as the need became more apparent? In what areas of the theater were safety personnel the most prevalent? What duties primarily occupied their time? Where were they most needed? What tasks did they accomplish? Were civilian safety personnel used in DS/S? What problems were there that were unique to civilians?)

7. Do you think that your service was prepared and resourced to perform safety functions adequately during DS/S?

(Key items: Was adequate safety expertise available? Was adequate support for safety personnel available? Was safety a primary concern of the command or was it an afterthought?)

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APPENDIX B
PROBLEM AREA PROFILES

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CATEGORY: Army Motor Vehicle - Driver Error

CLASSIFICATION: A-D

P.A. #7, TITLE: Following too close

OF ERRORS: 40 GRADES: E3 E4 E5 E6 E7 E8 UNK: 2
11 15 9 1 1 1

MOS SERIES INVOLVED:

UNK:7 11:1 13:1 31:2 62:1 63:1 71:1 76:6 77:2 88:16 91:1
94:1

ACTIVITIES OF PERSONS COMMITTING ERROR:

04WPH HNDL 16 OP VEH 18 MAINT 20 MAT HNDL 23 SUPV 28 PAX 29 LOCO
- - - - - - -

VEHICLE/EQUIPMENT: Trk, Tractor:21 Truck, Cargo:9 HEMTT:9 Trlr,
Van/Tank:6 CUCV:5 HMMWV:3 Semitrlr:3 Trk, Gov, NEC: 3
Trk, Wkr:1 Trk, Pov:1 Trk, Tank:1 Leased Auto:1 Pov NEC:1
Tank Unit:1

TASKS INVOLVED:

COLLECTIVE

INDIVIDUAL
Transporting Cargo-16

ACCIDENT LOCATIONS: ROADWAY VEH TRAIL TNG AREA OTHER UNK
(PAVED) 28 - - - 8
(DIRT) 2 - 1 - -
(OFF ROAD) - - 1 - -

ENVIRONMENTAL FACTORS INVOLVED:

WIND SAND RAIN FOG DUST INSUFF. LIGHT ROUGH TERRAIN
- - 2 1 3 2 1

GLARE BRIGHT SUN SANDSTORM
- - 3

EXTENT DAMAGE TO VEHICLE/EQUIPMENT:

TOT DEST. DINOP DPTOP DFOP UNK
- 7 28 19 3

NUMBER AND EXTENT OF INJURIES:

FATAL PTD PPD LWD RWA FAO UNK
- - - 8 - 2 -

SME OBS VALUE: 2.10

SME IMPORT. VALUE: 1.98

CATEGORY: Army Motor Vehicle - Driver Error

CLASSIFICATION: A-D

P.A. #1, TITLE: Excessive Speed

OF ERRORS: 30 GRADES: E1 1 E3 5 E4 14 E5 3 E6 2 O1 2 UNK: 3

MOS SERIES INVOLVED:

UNK:8 13:1 18:1 19:2 27:1 31:1 35:1 54:1 63:2 76:1 77:3
88:6 91:1 95:1

ACTIVITIES OF PERSONS COMMITTING ERROR:

04WPH HNDL 16 OP VEH 18 MAINT 20 MAT HNDL 23 SUPV 28 PAX 29 LOCO
- - - - - - - -

VEHICLE/EQUIPMENT: Trk, Tractor:8 HMMWV:9 Trk, Cargo:6 HEMTT:2
CUCV:2 Truck, Fuel:1 ARMD Recc Veh:1 Trk, NEC:1

TASKS INVOLVED:

COLLECTIVE

INDIVIDUAL
Transporting Cargo-6

ACCIDENT LOCATIONS: ROADWAY VEH TRAIL TNG AREA OTHER UNK
(PAVED) 13 - 2 - 5
(DIRT) 7 - - - -
(OFF ROAD) - - 3 - -

ENVIRONMENTAL FACTORS INVOLVED:

WIND SAND RAIN FOG DUST INSUFF. LIGHT ROUGH TERRAIN
1 2 5 - 3 4 2

GLARE BRIGHT SUN SANDSTORM

EXTENT DAMAGE TO VEHICLE/EQUIPMENT:

TOT DEST. DINOP 7 DPTOP 10 DFOP 7 UNK 6
8 -

NUMBER AND EXTENT OF INJURIES:

FATAL PTD - PPD 1 LWD 18 RWA 1 FAO 3 UNK -
9 -

SME OBS VALUE: 1.83

SME IMPORT. VALUE: 1.31

CATEGORY: Army Motor Vehicle - Driver Error

CLASSIFICATION: A-D

P.A. #17a, TITLE: Driver Inattention

OF ERRORS: 21 GRADES: E2 E3 E4 E5 O1 O2 O3 UNK: 1
 1 4 5 7 1 1 1

MOS SERIES INVOLVED:

31:2 42:1 63:5 67:2 77:1 88:3 95:1 UNK:6

ACTIVITIES OF PERSONS COMMITTING ERROR:

<u>04WPH HNDL</u>	<u>16 OP VEH</u>	<u>18 MAINT</u>	<u>20 MAT HNDL</u>	<u>23 SUPV</u>	<u>28 PAX</u>	<u>29 LOCO</u>
-	-	-	-	-	-	-
21						

VEHICLE/EQUIPMENT: Trk, Tractor:5 HEMTT:4 HMMWV:4 Trk, Cargo:3
 CUCV:2 Comm. Trk:1 Trk, NEC:1 Civ POV:1

TASKS INVOLVED:

COLLECTIVE

INDIVIDUAL
 Transporting Cargo-3

ACCIDENT LOCATIONS: ROADWAY VEH TRAIL TNG AREA OTHER UNK
 (PAVED) 12 - - - 6
 (DIRT) 1 - 1 - -
 (OFF ROAD) 1 - - - -

ENVIRONMENTAL FACTORS INVOLVED:

<u>WIND</u>	<u>SAND</u>	<u>RAIN</u>	<u>FOG</u>	<u>DUST</u>	<u>INSUFF. LIGHT</u>	<u>ROUGH TERRAIN</u>
-	-	1	-	1	2	-

GLARE BRIGHT SUN SANDSTORM
 1 - -

EXTENT DAMAGE TO VEHICLE/EQUIPMENT:

<u>TOT DEST.</u>	<u>DINOP</u>	<u>DPTOP</u>	<u>DFOP</u>	<u>UNK</u>
2	6	15	4	2

NUMBER AND EXTENT OF INJURIES:

<u>FATAL</u>	<u>PTD</u>	<u>PPD</u>	<u>LWD</u>	<u>RWA</u>	<u>FAO</u>	<u>UNK</u>
3	-	-	11	-	6	1

SME OBS VALUE: 2.86

SME IMPORT. VALUE: 1.95

CATEGORY: Army Motor Vehicle - Driver Error

CLASSIFICATION: A-D

P.A. #3, TITLE: Night and/or Duty Hours>8

OF ERRORS: 17 GRADES: E3 E4 E5 E6 O1 UNK: 0
 4 7 3 2 1

MOS SERIES INVOLVED:

11:1 13:1 16:1 29:2 31:2 63:1 77:1 83:2 88:3 UNK:3

ACTIVITIES OF PERSONS COMMITTING ERROR:

04WPH HNDL 16 OP VEH 18 MAINT 20 MAT HNDL 23 SUPV 28 PAX 29 LOCO
- - - - - - -

VEHICLE/EQUIPMENT: HMMWV:4 Trk, Tractor:4 Trk, Cargo:3 CUCV:2
HEMTT:2 Truck, 5T:1 Man 10T Tractor:1

TASKS INVOLVED:

COLLECTIVE

INDIVIDUAL
Transporting Cargo-2

ACCIDENT LOCATIONS: ROADWAY VEH TRAIL TNG AREA OTHER UNK
(PAVED) 9 - - - 5
(DIRT) - - - - -
(OFF ROAD) - - 3 - -

ENVIRONMENTAL FACTORS INVOLVED:

WIND SAND RAIN FOG DUST INSUFF. LIGHT ROUGH TERRAIN
- - 4 - 2 - -

GLARE BRIGHT SUN SANDSTORM
1 - 2

EXTENT DAMAGE TO VEHICLE/EQUIPMENT:

TOT DEST. DINOP DPTOP DFOP UNK
3 2 13 2 3

NUMBER AND EXTENT OF INJURIES:

FATAL PTD PPD LWD RWA FAO UNK
4 - 2 9 - 2 -

SME OBS VALUE: 2.69

SME IMPORT. VALUE: 2.00

CATEGORY: Army Motor Vehicle - Driver Error

CLASSIFICATION: A-D

P.A. #4, TITLE: Improper Turning

OF ERRORS: 15 GRADES: E2 E3 E4 E6 E7 O4 UNK: 1
1 3 7 1 1 1

MOS SERIES INVOLVED:

UNK:2 11:2 13:2 33:1 43:1 51:2 63:1 67:1 82:1 88:1 95:1

ACTIVITIES OF PERSONS COMMITTING ERROR:

04WPH HNDL 16 OP VEH 18 MAINT 20 MAT HNDL 23 SUPV 28 PAX 29 LOCO
- - - - - - -

15

VEHICLE/EQUIPMENT: HMMWV:6 CUCV:4 Trk, Tractor:3 Trk, Cargo:1
GOVT SDN:1

TASKS INVOLVED:

COLLECTIVE

INDIVIDUAL

ACCIDENT LOCATIONS:	<u>ROADWAY</u>	<u>VEH TRAIL</u>	<u>TNG AREA</u>	<u>OTHER</u>	<u>UNK</u>
(PAVED)	12	-	-	-	3
(DIRT)	-	-	-	-	-
(OFF ROAD)	-	-	-	-	-

ENVIRONMENTAL FACTORS INVOLVED:

<u>WIND</u>	<u>SAND</u>	<u>RAIN</u>	<u>FOG</u>	<u>DUST</u>	<u>INSUFF. LIGHT</u>	<u>ROUGH TERRAIN</u>
-	-	2	-	-	-	-
<u>GLARE</u>	<u>BRIGHT SUN</u>	<u>SANDSTORM</u>				
1	-	-				

EXTENT DAMAGE TO VEHICLE/EQUIPMENT:

<u>TOT DEST.</u>	<u>DINOP</u>	<u>DPTOP</u>	<u>DFOP</u>	<u>UNK</u>
4	2	6	5	4

NUMBER AND EXTENT OF INJURIES:

<u>FATAL</u>	<u>PTD</u>	<u>PPD</u>	<u>LWD</u>	<u>RWA</u>	<u>FAO</u>	<u>UNK</u>
3	-	-	5	2	1	-

SME OBS VALUE: 2.67

SME IMPORT. VALUE: 2.20

CATEGORY: Army Motor Vehicle - Driver Error

CLASSIFICATION: A-D

P.A. #6, TITLE: Improper Passing

OF ERRORS: 13 GRADES: E3 E4 E5 W2 UNK: 2
2 7 1 1

MOS SERIES INVOLVED:

UNK:5 19:1 67:1 76:2 52:1 88:2 915:1

ACTIVITIES OF PERSONS COMMITTING ERROR:

04WPH HNDL 16 OP VEH 18 MAINT 20 MAT HNDL 23 SUPV 28 PAX 29 LOCO
- - - - - - -

VEHICLE/EQUIPMENT: Trk, Cargo:6 Trk, Tractor:2 HMMWV:2
Trk, Wrecker:2 HEMTT:1

TASKS INVOLVED:

COLLECTIVE

INDIVIDUAL
Transporting Cargo-2

ACCIDENT LOCATIONS: ROADWAY VEH TRAIL TNG AREA OTHER UNK
(PAVED) 10 - - - 2
(DIRT) - - 1 - -
(OFF ROAD) - - - - -

ENVIRONMENTAL FACTORS INVOLVED:

WIND SAND RAIN FOG DUST INSUFF. LIGHT ROUGH TERRAIN
- - - - 1 1 -

GLARE BRIGHT SUN SANDSTORM
- - 1

EXTENT DAMAGE TO VEHICLE/EQUIPMENT:

TOT DEST. DINOP DPTOP DFOP UNK
1 - 3 4 7

NUMBER AND EXTENT OF INJURIES:

FATAL PTD PPD LWD RWA FAQ UNK
1 - - 9 - 3 -

SME OBS VALUE: 2.62

SME IMPORT. VALUE: 1.85

CATEGORY: Army Combat Vehicle - Crew Error

CLASSIFICATION: A-C

P.A. #6, TITLE: Crew Coordination/Communication

OF ERRORS: 7 GRADES: E3 E4 E5 O2 UNK: 0
2 3 1 1

MOS SERIES INVOLVED:

11:1 12:1 13:1 19:4

ACTIVITIES OF PERSONS COMMITTING ERROR:
04WPH HNDL 16 OP VEH 18 MAINT 20 MAT HNDL 23 SUPV 28 PAX 29 LOCO
2 - 1 - 2 - 2

VEHICLE/EQUIPMENT: M2 IFV:1 M1 Tank:5 M109 HOW:1

TASKS INVOLVED:

	COLLECTIVE	INDIVIDUAL
On/off Load Veh		Rollover Procedures
Retrograde Ops		Ground Guide
Traverse Gun Tube(2)		Secure Station(3)
CBT Drill		Clear Hang Fire
Conduct Fire Msn		-

ACCIDENT LOCATIONS: ROADWAY VEH TRAIL TNG AREA OTHER UNK
(PAVED) 1 1 - - 2
(DIRT) - - - - -
(OFF ROAD) - - - 3 -

ENVIRONMENTAL FACTORS INVOLVED:

<u>WIND</u>	<u>SAND</u>	<u>RAIN</u>	<u>FOG</u>	<u>DUST</u>	<u>INSUFF. LIGHT</u>	<u>ROUGH TERRAIN</u>
-	-	-	-	-	1	-
<u>GLARE</u>	<u>BRIGHT SUN</u>	<u>SANDSTORM</u>				
-	-	-				

EXTENT DAMAGE TO VEHICLE/EQUIPMENT:

TOT DEST. DINOP DPTOP DFOP UNK
- - - - -

NUMBER AND EXTENT OF INJURIES:

FATAL PTD PPD LWD RWA FAO UNK
- - 1 6 - 2 -

SME OBS VALUE: 2.00

SME IMPORT. VALUE: 2.00

CATEGORY: Army Combat Vehicle - Crew Error CLASSIFICATION: A-C

P.A. #1, TITLE: Inadequate Inspection/Check of Vehicle

OF ERRORS: 5 GRADES: E3 E5 UNK: 0
2 3

MOS SERIES INVOLVED:

11:2 13:1 19:2

ACTIVITIES OF PERSONS COMMITTING ERROR:

<u>04WPH HNDL</u>	<u>16 OP VEH</u>	<u>18 MAINT</u>	<u>20 MAT HNDL</u>	<u>23 SUPV</u>	<u>28 PAX</u>	<u>29 LOCO</u>
-	-	1	-	-	4	-

VEHICLE/EQUIPMENT:

M2 IFV:2 FISTV Carrier:1 ARMD RECC Veh:1 M1Tank:1

TASKS INVOLVED:	<u>COLLECTIVE</u> Movement-2 Perform Crew Duties-3	<u>INDIVIDUAL</u> PMCS-3 Secure Station-2
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ACCIDENT LOCATIONS:	<u>ROADWAY</u>	<u>VEH TRAIL</u>	<u>TNG AREA</u>	<u>OTHER</u>	<u>UNK</u>
(PAVED)	-	-	-	-	2
(DIRT)	-	-	-	-	-
(OFF ROAD)	-	-	3	-	-

ENVIRONMENTAL FACTORS INVOLVED:

<u>WIND</u>	<u>SAND</u>	<u>RAIN</u>	<u>FOG</u>	<u>DUST</u>	<u>INSUFF. LIGHT</u>	<u>ROUGH TERRAIN</u>
-	-	-	-	-	-	2

GLARE BRIGHT SUN SANDSTORM

EXTENT DAMAGE TO VEHICLE/EQUIPMENT:

<u>TOT DEST.</u>	<u>DINOP</u>	<u>DPTOP</u>	<u>DFOP</u>	<u>UNK</u>
-	1	-	-	-

NUMBER AND EXTENT OF INJURIES:

<u>FATAL</u>	<u>PTD</u>	<u>PPD</u>	<u>LWD</u>	<u>RWA</u>	<u>FAO</u>	<u>UNK</u>
-	-	1	4	-	-	-

SME OBS VALUE: 3.00

SME IMPORT. VALUE: 1.40

CATEGORY: Personal Injury - Weapons Handling

CLASSIFICATION: A-C

P.A. # 2, TITLE: Unauthorized Use or Handling of Weapons, Ammunition, or Ordnance

OF ERRORS: 10 GRADES: E2 E3 E4 E5 E6 UNK: 0
1 2 3 3 1

MOS SERIES INVOLVED:
12:2 19:1 29:1 45:1 62:1 63:2 76:1 88:1

ACTIVITIES OF PERSONS COMMITTING ERROR:
04WPH HNDL 16 OP VEH 18 MAINT 20 MAT HNDL 23 SUPV 28 PAX 29 LOCO
10 - - - - - - - -

VEHICLE/EQUIPMENT: Small Arms Ammo:2 Propellants:1 Parachute
Flare:3 Hoffman Device:2 ATWESS:1 ARTY Simulator:1

TASKS INVOLVED: COLLECTIVE INDIVIDUAL
- - - - - - - -

ACCIDENT LOCATIONS:

TRAVELWAY, NEC VESSEL TNG AREA VEH FAC MAINT FAC CONST SITE
- - - - - - - -

ACFT FAC STOR BLDG SVC FAC HOUSING FAC AIRPORT OFF BLDG
- - - - - - - -

RANGE PORT/DOCK VEH TRAIL
- - - - - - - -

ENVIRONMENTAL FACTORS INVOLVED: NA
WIND SAND RAIN FOG DUST INSUFF. LIGHT ROUGH TERRAIN
- - - - - - - -

GLARE BRIGHT SUN SANDSTORM
- - - - - - - -

EXTENT DAMAGE TO VEHICLE/EQUIPMENT: NA
TOT DEST. DINOP DPTOP DFOP UNK
- - - - - - - -

NUMBER AND EXTENT OF INJURIES:

FATAL PTD PPD LWD RWA FAO UNK
- - - 11 - 2 -

SME OBS VALUE: 2.00 SME IMPORT. VALUE: 1.46

CATEGORY: Personal Injury - Weapons Handling

CLASSIFICATION: A-C

P.A. #4/8, TITLE: Improper Clearing Prior to or During Assembly,
Disassembly, Cleaning, Disarming or Unloading

OF ERRORS: 24 GRADES: E2 E3 E4 E5 E6 E7 O1 O4 UNK: 1
4 2 8 4 1 1 1 2

MOS SERIES INVOLVED:

UNK:7 11:1 12:1 19:4 35:1 63:4 67:1 76:1 77:1 95:3

ACTIVITIES OF PERSONS COMMITTING ERROR:

04WPH HNDL 16 OP VEH 18 MAINT 20 MAT HNDL 23 SUPV 28 PAX 29 LOCO
24 - - - - - - -

VEHICLE/EQUIPMENT: M60 Mach Gun:2 M16:8 Pistol, 45 Cal:11
Pistol, 9MM:2 Pistol, Auto, NEC:1

TASKS INVOLVED:

COLLECTIVEINDIVIDUAL

Clear & safe ind weapon-13
Clear & safe crew served wpn-2
Perf. functional check on ind
wpn-6

ACCIDENT LOCATIONS:

<u>TRAVELWAY, NEC</u>	<u>VESSEL</u>	<u>TNG AREA</u>	<u>VEH FAC</u>	<u>MAINT FAC</u>	<u>CONST SITE</u>
2	-	21	-	-	-

<u>A/C FAC</u>	<u>STOR BLDG</u>	<u>SVC FAC</u>	<u>HOUSING FAC</u>	<u>AIRPORT</u>	<u>OFF BLDG</u>
-	-	-	-	-	-

<u>RANGE</u>	<u>PORT/DOCK</u>
--------------	------------------

1	-
---	---

ENVIRONMENTAL FACTORS INVOLVED: NA

<u>WIND</u>	<u>SAND</u>	<u>RAIN</u>	<u>FOG</u>	<u>DUST</u>	<u>INSUFF. LIGHT</u>	<u>ROUGH TERRAIN</u>
-	-	-	-	-	-	-

<u>GLARE</u>	<u>BRIGHT SUN</u>	<u>SANDSTORM</u>
-	-	-

EXTENT DAMAGE TO VEHICLE/EQUIPMENT:

<u>TOT DEST.</u>	<u>DINOP</u>	<u>DPTOP</u>	<u>DFOP</u>	<u>UNK</u>
-	-	-	1	-

NUMBER AND EXTENT OF INJURIES:

<u>FATAL</u>	<u>PTD</u>	<u>PPD</u>	<u>LWD</u>	<u>RWA</u>	<u>FAO</u>	<u>UNK</u>
2	-	2	20	-	-	-

SME OBS VALUE: 3.00

SME IMPORT. VALUE: 1.00

CATEGORY: Personal Injury - Materiel Handling

CLASSIFICATION: A-C

P.A. #1, TITLE: Improper Technique

OF ERRORS: 41 GRADES: E1 E2 E3 E4 E5 E6 E8 UNK: 0
0 3 9 19 5 3 2

MOS SERIES INVOLVED:

UNK:7 11:1 12:1 13:3 31:4 52:1 63:3 67:2 68:3 73:1 76:6
88:5 91:1 94:1 95:1 97:1

ACTIVITIES OF PERSONS COMMITTING ERROR:

04WPH HNDL 16 OP VEH 18 MAINT 20 MAT HNDL 23 SUPV 28 PAX 29 LOCO
- - - - 41 - - -

VEHICLE/EQUIPMENT:

TASKS INVOLVED:

COLLECTIVE

INDIVIDUAL

ACCIDENT LOCATIONS:

<u>TRAVELWAY</u>	<u>NEC</u>	<u>VESSEL</u>	<u>TNG AREA</u>	<u>VEH FAC</u>	<u>MAINT FAC</u>	<u>CONST SITE</u>
2		1	26	2	-	-
<u>ACFT AC</u>	<u>STOR BLDG</u>	<u>SVC FAC</u>	<u>HOUSING FAC</u>	<u>AIRPORT</u>	<u>OFF BLDG</u>	
-	4	1	1	2	1	

PORT/DOCK

1

ENVIRONMENTAL FACTORS INVOLVED: NA
WIND SAND RAIN FOG DUST INSUFF. LIGHT ROUGH TERRAIN
- - - - - - - -

GLARE BRIGHT SUN SANDSTORM
- - - -

EXTENT DAMAGE TO VEHICLE/EQUIPMENT: NA
TOT DEST. DINOP DPTOP DFOP UNK
- - - - -

NUMBER AND EXTENT OF INJURIES:

<u>FATAL</u>	<u>PTD</u>	<u>PPD</u>	<u>LWD</u>	<u>RWA</u>	<u>FAO</u>	<u>UNK</u>
-	-	2	39	-	-	-

SME OBS VALUE: 2.46

SME IMPORT. VALUE: 2.01

CATEGORY: Personal Injury - Materiel Handling

CLASSIFICATION: A-C

P.A. #3, TITLE: Inadequate Precautions for Environmental Hazards

OF ERRORS: 7 GRADES: E3 E4 E5 UNK: 0
4 1 2

MOS SERIES INVOLVED:

36:1 63:1 67:1 76:2 82:1 88:1

ACTIVITIES OF PERSONS COMMITTING ERROR:

04WPH HNDL 16 OP VEH 18 MAINT 20 MAT HNDL 23 SUPV 28 PAX 29 LOCO
- - - - 7 - -

VEHICLE/EQUIPMENT:

TASKS INVOLVED: COLLECTIVE INDIVIDUAL

ACCIDENT LOCATIONS:

TRAVELWAY NEC VESSEL TNG AREA VEH FAC MAINT FAC CONST SITE
- - - 6 - - 1 -

ACFT AC STOR BLDG SVC FAC HOUSING FAC AIRPORT OFF BLDG
- - - - - -

PORT/DOCK
-

ENVIRONMENTAL FACTORS INVOLVED: NA

WIND SAND RAIN FOG DUST INSUFF. LIGHT ROUGH TERRAIN
4 - - - - - -

GLARE BRIGHT SUN SANDSTORM HEAT ICE WET SURFACE
- - - 5 1 1

EXTENT DAMAGE TO VEHICLE/EQUIPMENT: NA
TOT DEST. DINOP DPTOP DFOP UNK
- - - - -

NUMBER AND EXTENT OF INJURIES:

FATAL PTD PPD LWD RWA FAO UNK
- - - 7 - - -

SME OBS VALUE: 2.00

SME IMPORT. VALUE: 2.86

CATEGORY: Personal Injury - Materiel Handling

CLASSIFICATION: A-C

P.A. #2, TITLE: Failure to Properly Secure Load

OF ERRORS: 6 GRADES: E3 E4 E5
1 1 3

UNK: 1

MOS SERIES INVOLVED:

UNK:2 13:1 62:1 63:2

ACTIVITIES OF PERSONS COMMITTING ERROR:
04WPH HNDL 16 OP VEH 18 MAINT 20 MAT HNDL 23 SUPV 28 PAX 29 LOCO
- - - - 6 - -

VEHICLE/EQUIPMENT:

TASKS INVOLVED: COLLECTIVE INDIVIDUAL

ACCIDENT LOCATIONS:

<u>TRAVELWAY</u>	<u>NEC</u>	<u>VESSEL</u>	<u>TNG AREA</u>	<u>VEH FAC</u>	<u>MAINT FAC</u>	<u>CONST SITE</u>
1	-	-	1	1	-	1
<u>ACFT FAC</u>	<u>STOR BLDG</u>	<u>SVC FAC</u>	<u>HOUSING FAC</u>	<u>AIRPORT</u>	<u>OFF BLDG</u>	-
1	1	-	-	-	-	-

PORT/DOCK

ENVIRONMENTAL FACTORS INVOLVED: NA
WIND SAND RAIN FOG DUST INSUFF. LIGHT ROUGH TERRAIN
- - - - - - - -

GLARE BRIGHT SUN SANDSTORM

EXTENT DAMAGE TO VEHICLE/EQUIPMENT: NA
TOT DEST. DINOP DPTOP DFOP UNK
- - - - -

NUMBER AND EXTENT OF INJURIES:

<u>FATAL</u>	<u>PTD</u>	<u>PPD</u>	<u>LWD</u>	<u>RWA</u>	<u>FAO</u>	<u>UNK</u>
3	-	1	6	-	-	-

SME OBS VALUE: 1.34

SME IMPORT. VALUE: 2.50

CATEGORY: Personal Injury - Maintenance

CLASSIFICATION: A-C

P.A. #1, TITLE: Used Improper Tool/Equipment

OF ERRORS: 27 GRADES: E1 E3 E4 E5 E6 E7 UNK: 1
1 6 10 7 1 1

MOS SERIES INVOLVED:

UNK:2 13:1 19:4 31:2 44:1 62:1 63:5 67:2 68:2 77:1 88:5
91:1

ACTIVITIES OF PERSONS COMMITTING ERROR:

04WPH HNDL 16 OP VEH 18 MAINT 20 MAT HNDL 23 SUPV 28 PAX 29 LOCO
- - - - - - - -

27

VEHICLE/EQUIPMENT:

TASKS INVOLVED:

COLLECTIVE

INDIVIDUAL

ACCIDENT LOCATIONS:

<u>TRAVELWAY, NEC</u>	<u>VESSEL</u>	<u>TNG AREA</u>	<u>VEH FAC</u>	<u>MAINT FAC</u>	<u>CONST SITE</u>
-	-	15	7	3	-
<u>ACFT AC</u>	<u>STOR BLDG</u>	<u>SVC FAC</u>	<u>HOUSING FAC</u>	<u>AIRPORT</u>	<u>OFF BLDG</u>
-	-	-	1	1	-

PORT/DOCK

ENVIRONMENTAL FACTORS INVOLVED: NA

<u>WIND</u>	<u>SAND</u>	<u>RAIN</u>	<u>FOG</u>	<u>DUST</u>	<u>INSUFF. LIGHT</u>	<u>ROUGH TERRAIN</u>
-	-	-	-	-	-	-
<u>GLARE</u>	<u>BRIGHT SUN</u>	<u>SANDSTORM</u>				
-	-	-				

EXTENT DAMAGE TO VEHICLE/EQUIPMENT: NA

<u>TOT DEST.</u>	<u>DINOP</u>	<u>DPTOP</u>	<u>DFOP</u>	<u>UNK</u>
-	-	-	-	-

NUMBER AND EXTENT OF INJURIES:

<u>FATAL</u>	<u>PTD</u>	<u>PPD</u>	<u>LWD</u>	<u>RWA</u>	<u>FAO</u>	<u>UNK</u>
-	-	1	27	-	-	-

SME OBS VALUE: 1.14

SME IMPORT. VALUE: 2.46

CATEGORY: Personal Injury - Maintenance

CLASSIFICATION: A-C

P.A. #3, TITLE: Improper Body Position

OF ERRORS: 13 GRADES: E3 E4 E5 E6 E7 UNK:

2 5 4 1 1

MOS SERIES INVOLVED:

44:1 52:2 63:6 67:2 68:1 88:1

ACTIVITIES OF PERSONS COMMITTING ERROR:

04WPH HNDL 16 OP VEH 18 MAINT 20 MAT HNDL 23 SUPV 28 PAX 29 LOCO

13

VEHICLE/EQUIPMENT:

TASKS INVOLVED:

COLLECTIVE

INDIVIDUAL

ACCIDENT LOCATIONS:

TRAVELWAY, NEC VESSEL TNG AREA VEH FAC MAINT FAC CONST SITE

8

3

1

ACFT AC STOR BLDG SVC FAC HOUSING FAC AIRPORT OFF BLDG

1

PORT/DOCK

ENVIRONMENTAL FACTORS INVOLVED: NA
WIND SAND RAIN FOG DUST INSUFF. LIGHT ROUGH TERRAIN

GLARE BRIGHT SUN SANDSTORM

EXTENT DAMAGE TO VEHICLE/EQUIPMENT: NA

TOT DEST. DINOP DPTOP DFOP UNK

NUMBER AND EXTENT OF INJURIES:

FATAL PTD PPD LWD RWA FAO UNK

1

12

SME OBS VALUE: 1.92

SME IMPORT. VALUE: 2.38

CATEGORY: Personal Injury - Maintenance

CLASSIFICATION: A-C

P.A. #7c, TITLE: Used Improper Procedures

OF ERRORS: 13 GRADES: E3 E4 E5 E6 UNK:

4 6 2 1

MOS SERIES INVOLVED:

UNK:3 19:1 31:1 52:1 63:4 67:1 88:1 93:1

ACTIVITIES OF PERSONS COMMITTING ERROR:

04WPH HNDL 16 OP VEH 18 MAINT 20 MAT HNDL 23 SUPV 28 PAX 29 LOCO

13 - - -

VEHICLE/EQUIPMENT:

TASKS INVOLVED:

COLLECTIVE

INDIVIDUAL

ACCIDENT LOCATIONS:

<u>TRAVELWAY</u>	<u>NEC</u>	<u>VESSEL</u>	<u>TNG AREA</u>	<u>VEH FAC</u>	<u>MAINT FAC</u>	<u>CONST SITE</u>
-	-	-	9	-	2	-
<u>ACFT</u>	<u>AC</u>	<u>STOR BLDG</u>	<u>SVC FAC</u>	<u>HOUSING FAC</u>	<u>AIRPORT</u>	<u>OFF BLDG</u>
-	-	-	-	-	2	-

PORT/DOCK

ENVIRONMENTAL FACTORS INVOLVED: NA
WIND SAND RAIN FOG DUST INSUFF. LIGHT ROUGH TERRAIN

GLARE BRIGHT SUN SANDSTORM

EXTENT DAMAGE TO VEHICLE/EQUIPMENT: NA
TOT DEST. DINOP DPTOP DFOP UNK

NUMBER AND EXTENT OF INJURIES:

<u>FATAL</u>	<u>PTD</u>	<u>PPD</u>	<u>LWD</u>	<u>RWA</u>	<u>FAO</u>	<u>UNK</u>
1	-	-	9	-	-	-

SME OBS VALUE: 1.15

SME IMPORT. VALUE: 2.08

CATEGORY: Personal Injury - Maintenance

CLASSIFICATION: A-C

P.A. #6, TITLE: Inadequate inspection of components, equipment, or work area

OF ERRORS: 9 GRADES: E2 E3 E4 E5 E6 UNK:

2 1 2 3 1

MOS SERIES INVOLVED:

UNK:1 52:2 54:1 63:2 74:1 76:1 77:1

ACTIVITIES OF PERSONS COMMITTING ERROR:

04WPH HNDL 16 OP VEH 18 MAINT 20 MAT HNDL 23 SUPV 28 PAX 29 LOCO

9

VEHICLE/EQUIPMENT:

TASKS INVOLVED: COLLECTIVE INDIVIDUAL

ACCIDENT LOCATIONS:

TRAVELWAY, NEC VESSEL TNG AREA VEH FAC MAINT FAC CONST SITE

6 2

ACFT AC STOR BLDG SVC FAC HOUSING FAC AIRPORT OFF BLDG

PORT/DOCK Fire Station

1

ENVIRONMENTAL FACTORS INVOLVED:

WIND SAND RAIN FOG DUST INSUFF. LIGHT ROUGH TERRAIN

GLARE BRIGHT SUN SANDSTORM

1

EXTENT DAMAGE TO VEHICLE/EQUIPMENT: NA

TOT DEST. DINOP DPTOP DFOP UNK

NUMBER AND EXTENT OF INJURIES:

FATAL PTD PPD LWD RWA FAO UNK

9

SME OBS VALUE: 2.00

SME IMPORT. VALUE: 2.11

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APPENDIX C
PROBLEM AREA PROFILE DATA SHEETS

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AMV FOLLOWING TOO CLOSE PROFILES

SEQ	GRP & CASE #	PA7 TYPE	CODE/VEHICLE TYPE	MOS	GRADE	CONVOY?	ROAD TYPE	CODE/TYPE INJURY	DAMAGE
9	2-9011226003	a	CUCV,M109	31	E6	Y	Off	g None	DPTOP
10		a		Unk	E5			d Ribs bruised	DPTOP
12		c	HMMWV						DPTOP
15	2-910101011	c	CUCV, M1028	31	E5	Y	Paved	g None	DPTOP
16		c	CUCV, M1028						DINOP
22		a	CUCV, M1008						DPTOP
24		a	POV,NEC						DPTOP
25	4-901116011	c	Auto, leased	76	E4	N	Paved	g None	DPTOP
26		c	HMMWV						DPTOP
55	6-910410007	b	HMMWV	71	E9	N	Paved	f No injury	DPTOP
61	11-910317011	c	CUCV,M1010	Unk	Unk	N	Paved	g None	DFOP
65		c	Tank unit						DINOP
1	1-910110036	c	b Trk,Gov,NEC	88	E3	Y	Paved	d Head concussion	DINOP
2		c	b Trk,Gov,NEC						DFOP
21	4-901110026	a	b Trk,cargo,M35A2	Unk	E4	Y	Unk	g None	None
23	4-901110027	a	b Trk,cargo,M35A2	Unk	E4	Y	Paved	g None	None
27	4-911221009	c	b Trk,cargo,M923A2	76	E3	Unk	Paved	g None	DPTOP
28		c	b Trk,cargo,M923A2						DFTOP
29		c	b Trk,cargo,M923A2						DFTOP
31	4-910103013	c	b Trk,cargo,M813	76	E4	Y	Paved	g None	DPTOP
32		c	b Trk,tractor,M818						DFOP
42	5-910131021	c	b Trk,cargo,M35A2	88	E3	N	Paved	g None	None
43		c	b Trk,Van,NEC						DPTOP
46	5-9101219021	b	b Trk,tank,NEC	11	E3	N	Paved	g None	DPTOP
59		b	b Trk,Wlk,M816						DFOP
60	9-910113017	a	b Trk,cargo,M923A2	76	E4	N	Unk	d Back contusion	DFOP
62		a	b Trk,POV						DPTOP
63	11-9105090010	a	b Trk,Gov,NEC	77	E4	Y	Paved	g None	DFOP
64		a	b Trk,Gov						DFOP
66	12-910208025	a	b Trk,cargo,NEC	91	E7	Y	Paved	d Head lacerations	DPTOP
3	1-910120008	c	c Trk,tractor,M911	88	E3	Y	Paved	g None	DPTOP

Note: Accident cases are sub-grouped by vehicle weight (i.e. < 2 1/2 ton, 2 1/2 - 5 ton, > 5 ton)

AMV FOLLOWING TOO CLOSE PROFILES (continued)

SEQ	GRP & CASE #	PA7 TYPE	CODE/VEHICLE TYPE	MOS	GRADE	CONVOY?	ROAD TYPE	CODE/TYPE INJURY	DAMAGE
4		c	Semitrl, M747						DFOP
5	1-910213030	b	c Trk, tractor, M915A1	76	E3	N	Unk	g None	DINOP
6	1-910214032	c	c Trk, tractor, M931	Unk	Unk	Y	Paved	d Knee edema	None
7	1-910218010	a	c Trk, tractor, M915A1	88	E5	N	Unk	g None	DINOP
8		a	c	88	E4			d Neck sprain	
11	2-901228008	c	c HEMTT, M977	88	E5	N	Paved	g None	DPTOP
13	2-901231010	b	c HEMTT, M978	94	E4	Y	Unk	g None	DPTOP
14		b	c HEMTT, M978						DFOP
17	3-910320018	b	c Trk, tractor, M818	88	E3	Y	Paved	g None	DINOP
18		b	c Trl, tank, NEC						TD
19	3-910321017	a	c Trk, tractor, M931	77	E4	Y	Dirt	d Head laceration	DPTOP
20		a	c Trl, tank, M969						DFOP
30	4-91010102013	c	c Trk, tractor, M915	88	E5	N	Paved	g None	DPTOP
33	4-910108022	c	c Trk, tractor, M915	88	E3	N	Unk	g None	DPTOP
34	5-910116002	c	c Trk, tractor, M915A1	88	E5	N	Paved	g None	DPTOP
35	5-910119018	c	c Trk, tractor, M915	88	E4	N	Paved	g None	DFOP
36	5-910122011	c	c Trk, tractor, M915	88	E4	N	Paved	g None	DPTOP
37	5-910126005	c	c Trk, tractor, M915A1	Unk	E5	Y	Paved	g None	DINOP
38		c	c Semitrl, NEC						DFOP
39	5-910128022	c	c Trk, tractor, M915A1	Unk	E4	Y	Paved	g None	DPTOP
40		c	c Semitrl, M872A3						DFOP
41	5-910131008	b	c Trk, tractor, M931	88	E5	Y	Paved	g None	DPTOP
44	5-910203007	c	c Trk, tractor, M915	88	E5	N	Paved	g None	DPTOP
45	5-910216008	c	c Trk, tractor, M915A1	88	E4	Y	Paved	g None	DPTOP
47	5-910319012	b	c HEMTT, M977	88	E4	Y	Unk	g None	DFOP
48		b	c HEMTT, M977						DFOP
49	5-910321014	b	c Trk, tractor, M920	62	E4	N	Paved	g None	DPTOP
50	5-910321018	c	c Trk, tractor, M818	76	E3	N	Unk	f Unk	DPTOP
51		c	c Trl, tank, M967A1						DFOP
52	6-910402013	a	c HEMTT, M977	13	E3	Y	Dirt	g None	DFOP
53		a	c HEMTT, M977						DFOP

AMV FOLLOWING TOO CLOSE PROFILES (continued)

SEQ	GRP & CASE #	PA7 TYPE	CODE/VEHICLE TYPE	MOS	GRADE	CONVOY?	ROAD TYPE	CODE/TYPE INJURY	DAMAGE
54		a	HEMTT,M977						DFOP
56	7-900102015	a	c Trk,tractor,M915	Unk	E4	Y	Paved	g None	DINOP
57	8-901208008	a	c HEMTT,M977	88	E3	Y	Unk	g None	DPTOP
58	8-910310011	c	c Trk,tractor,M915A1	63	E5	N	Paved	d Knee contusion	DINOP

22 Total LWD

2.75 Avg LWD/Injury

0.6 Avg LWD/Case

2.75 Avg LWD/LWD Case

AMV EXCESSIVE SPEED PROFILES

SEQ	GRP & CASE #	PAI TYPE	CODE/VEHICLE TYPE	MOS	GRADE	CONVOY?	ROAD TYPE	CODE/TYPE INJURY	DAMAGE
2	1-910212M07	a HMMWV	Unk	Q1	N		Paved	G None	DINOP
4	1-910220M121	a HMMWV	18	E6	N		Paved	C Back broken	TD
4		a						D Back strained	
5	2-901126M01	a ArmRecVeh	54	E5	N(TF)	Off	D Head contusion		TD
5		a						D Knee laceration	
5		a						D Other contusion	
5		a						D Shoulder dislocation	
12	4-900991013	a HMMWV	19	E1	N		Paved	G None	DPTOP
15	5-910208012	a HMMWV	91	E4	N		Off	F Back strained	DPTOP
15		a HMMWV	11A	O2	N		Paved	F Back strained	DINOP
22	8-910103020	a CUCV,M1009	Unk	Unk	N		Unk	G None	None
22		a						D Chest puncture	
24	8-910219011	a CUCV,M1009	88	E4	N		Dirt	G None	DFOP
24		a						D Head contusion	
25	11-910105029	d a HMMWV	Unk	E4	N		Unk	G None	DPTOP
25		d a Shipping containers							Unk
27	12-910430001	a HMMWV	95	E3	N		Paved	A Fatal	DFOP
27		a						D Rib fractures	
27		a						D Rib fractures	
28	12-910220M02	a a HMMWV	88	E4	N	Off	A Fatal		DPTOP
28		a a						A Fatal	
30	13-910914M01	a a HMMWV	76	E4	N	Dirt	D Head concussion		DINOP
30		a a						A Fatal	
1	1-910105M04	a b Trk,cargo,M923	63	E4	N	Dirt	A Fatal		TD
3	1-910217M05	a b Trk,NEC	77	E4	N	Dirt	D Head laceration		TD
3		a b						A Fatal	
6	3-910224012	a b Trk,NEC	31	E4	Y	Dirt	G None		TD
13	4-901123M011	b Trk,cargo,M813A1	63	E4	Y	Paved	G None	None	
13		b						TD	
16	5-910226M013	a b Trk,NEC	13A	Q1	N	Dirt	F Head laceration	DINOP	
23	8-910217M06	a b Trk cargo,M923A2	35	E4	N	Paved	D Head lunk	DINOP	

AMV EXCESSIVE SPEED PROFILES

SEQ	GRP & CASE #	PA1 TYPE	CODE/VEHICLE TYPE	MOS	GRADE	CONVOY?	ROAD TYPE	CODE/TYPE INJURY	DAMAGE
23		a b		60N	O4			A Fatal	
23		a b		91	E5			D Arm fracture	
23		a b		60N	O4			D Head lunk	
23		a b		35	E5			D Spleen ruptured	
26	12-910305022	a b	Trk,cargo,M923A1	Unk	Unk	N	Dirt	G None	DINOP
26		a b		77	E4			D Arm contusion	
29	12-910501013	a b	Trk,cargo,M923A1	77	E4	Y	Unk	G None	DINOP
29		a b	Water purification Equip						TD
7	3-910227012	a c	Trk,tractor,M931	88	E3	Y	Paved	D Back strained	TD
8	3-910312001	a c	Trk,tractor,M931	27	E4	Y	Paved	A Fatal	TD
9	3-910317008	a c	HEMTT,fuel tanker	Unk	E5			G None	DFOP
9		a c	HEMTT,fuel tanker	19	E4			E Neck strained	DINOP
9		a c	HEMTT,fuel tanker					G None	DPTOP
9		a c	HEMTT,fuel tanker					G None	DFOP
10	3-910317017	c c	HEMTT,fuel tanker	19	E3	Y	Unk	G None	DFOP
10		c c	HEMTT,fuel tanker					G None	DPTOP
11	3-910327001	a c	Trk,tractor,M818	77	E4	Y	Unk	A Fatal	TD
11		a c		77	E5			D Leg fracture	DFOP
11		a c	Trk,tractor,POV						DPTOP
14	5-910127007	a c	Trk,tractor,M915A1	Unk	E5	N	Paved	G None	DFOP
14		a c	Semitrtr,NEC						DFOP
17	6-910322020	a c	Trk,tractor,M915A1	88	E3	N	Unk	G None	DPTOP
18	6-910402013	a c	Trk,tractor,M915A1	88	E3	Y	Unk	G None	DPTOP
18		a c	Trk,tractor,M915A1						DFOP
19	7-901121011	c c	Trk,tractor,M920	Unk	Unk	Unk		G None	DPTOP
20	7-910131013	a c	Trk,tractor,POV	Unk	E4	N	Paved	G None	DFOP
21	7-910401008	a c	Trk,tractor,M931	88	E6	N	Dirt	G None	DPTOP

583 Total LWD
 31 Avg LWD/Injury
 19 Avg LWD/Case
 53 Avg LWD/LWD Case

ACV CREW COORDINATION/COMMUNICATION PROFILES

SEQ	GRP & CASE #	PA6 TYPE	CODE/VEHICLE TYPE	MOS	GRADE	CONVOY?	ROAD TYPE	CODE/TYPE INJURY	DAMAGE
1	1-901216007	c	Tank,M1A1	19	E5	N	NA	D Back strained	DINOP
2		c		19	E1			F Head contusion	
3	1-910224009	d	FV,NEC	11	E3	N	Unk	D Hip fracture	None
4	1-910228019	c	Tank,NEC	12	E2	N	Unk	G None	None
5		c		19	E5			D Knee fracture	
6	1-910414009	d	Tank,M1A1	19	E4	N	Unk	D Skull fracture	None
7	1-901115017	a	Howitzer,M109A2	13	E4	N	Dirt	G None	None
8		a		13	E6			D Head contusion	
9	2-910219020	d	Tank,M1A1	19	E5	N	Unk	D Ribs fracture	None
10	2-910302013	d	Tank,M1A1	19	E4	N	Unk	C Ankle fracture	None

319 Total LWD

46 Avg LWD/Case & Injury
53 Avg LWD/LWD Case

ACV INADEQUATE INSPECTION/CHECK PROFILES

SEQ	GRP & CASE #	PA1 TYPE	CODE/VEHICLE TYPE	MOS	GRADE	CONVOY?	ROAD TYPE	CODE/TYPE INJURY	DAMAGE
1	1-901118016	a	Carrier,M981(FISTV)	13	E3	N	Off	D Mouth contusion	None
2	1-900911020	b	Light Armd Veh,LAV 25	19	E5	N	Unk	D Fingers fracture	None
3	1-901004010	a	IFV,M2	11	E5	N	Off	D Ankle sprain	None
4	1-901226010	c	Tank,M1A1	19	E3	N	Unk	D Fingers fracture	None
5	1-910219018	a	IFV,M2	11	E5	N	Off	C Finger amputation	None

140 Total LWD

28 Avg LWD/Case & Injury
35 Avg LWD/LWD Case

ACV EXCESSIVE SPEED PROFILES

SEQ	GRP & CASE #	PA3 TYPE	CODE/VEHICLE TYPE	MOS	GRADE	CONVOY?	ROAD TYPE	CODE/TYPE INJURY	DAMAGE
1	1-901226011	a	Carrier,M113A2	12	E5	N	Off	D Mouth contusion	None
2	2-910319031	a	IFV,M2	11	E3	Y	Paved	D Back contusion	DPTOP
3		a		11	E3			D Hand fracture	
4	2-910412018	a	Carrier,M577	13	E6	N	Off	D Back contusion	None
5	2-910416001	a	FAASV,M992	13	Unk	Y	Off	D None	DFOP
6		a	HOWITZER,M109A2					G None	DPTOP

45 Total LWD
 11 Avg LWD/Case & Injury
 15 Avg LWD/LWD Case

PERSONAL INJURY - WEAPONS HANDLING PROFILES

PA#2 - UNAUTHORIZED USE/HANDLING OF SIMULATORS, PYROTECHNICS, HOFFMAN DEVICES, ETC.

SEQ	GRP & CASE #	CODE - WEAPON/AMMO TYPE	MOS	GRADE	TYPE INJURY	DAYS LOST
1	1-910223019	Parachute flare	45	E5	d Body in general wounds NEC	180
2			45	E6	f Head wounds NEC	0
3			45	E5	f Face wounds NEC	0
4	2-910303013	Parachute flare	63	E3	d Face/hands burns 3rd deg	30
5	2-910313014	.50 cal round primer	88	E5	d Fingers laceration	21
6	2-910313025	Powder/propellants	12	E6	d Face/hands burns 2nd deg	2
7	2-910315W07	.30 cal round primer	29	E3	d Burns fingers	2
*8	9-881113W04	Parachute flare	76	E4	d Hand burns	10
9			76	E3	d Hand burns	10
*10	9-881117W03	Hoffman device	19	E5	d Face burns	15
*11	9-890110012	Hoffman device	12	E4	d Head burns	9
*12	9-890311W03	Atwess device	62	E4	d Hand burns	10
*13	9-890827013	Arty simulator	63	E2	d Hand burns	4
						293
						Total Lost Workdays

26.6 Avg LWD/Injury

29.3 Avg LWD/Case

29.3 Avg LWD/LWD Case

* NTC Accidents

PERSONAL INJURY - WEAPONS HANDLING PROFILES (continued)

SEQ		GRP & CASE #		CODE - WEAPON/AMMO		MOS		GRADE		TYPE INJURY		DAYS LOST		WOUNDED SELF?	
1	1-901108026	a	Pistol, Auto NEC		Unk	O4	d	Leg puncture		17		Y			
2	1-910121023	b	Rifle, M16		76	E3	d	Hand puncture		60		Y			
3	1-910126010	a	Pistol, 9MM		12	04	c	Hand puncture		Unk		Y			
4	1-910201017	b	Rifle, M16		63	E4	d	Thigh puncture		30		Y			
5	1-910203003	b	Rifle, M16		Unk	E4	d	Ribs puncture		15		Y			
6	1-910222018	a	Pistol, .45 cal		19	E2	d	Leg puncture		30		Y			
7	1-910301005	a	Pistol, .45 cal		63	E5	c	Hand puncture		Unk		Y			
8	1-910301008	b	Rifle, M16		Unk	E2	d	Foot puncture		30		Y			
9	1-910301011	b	Rifle, M16		19	E6	d	Foot puncture		60		Y			
10	1-910302012	a	Pistol, .45 cal		19	E4	d	Abdomen puncture		30		Y			
11	1-910303002	a	Pistol, .45 cal		95	E2	a	Fatal/chest puncture		NA		N			
12	1-910303011	a	Pistol, .45 cal		95	E4	d	Abdomen puncture		30		Y			
13	1-910313021	a	Pistol, .45 cal		63	E7	d	Knee puncture		60		Y			
14	1-910402012	a	Pistol, .45 cal		95	E4	d	Thigh puncture		30		Y			
15	2-910309001	b	Rifle, M16		77	E3	a	Fatal/chest puncture		NA		N			
16	2-910406030	a	Pistol, .45 cal		35	O1	d	Leg puncture		15		Y			
17	2-910222018	a	Pistol, .45 cal		19	E2	d	Leg puncture		30		Y			
18	2-910126007	a	Pistol, .45 cal		Unk	E4	d	Leg puncture		17		N			
19	2-910121009	a	Pistol, 9MM		11	E5	d	Chest puncture		7		N			
20	2-910114013	a	Pistol, .45 cal		Unk	E4	d	Abdomen puncture		17		N			
21	2-910125016	b	Rifle, M16		Unk	E5	d	Leg puncture		17		N			
22	2-910123015	b	Rifle, M16		Unk	Unk	d	Foot puncture		17		Y			
23	2-910117006	c	MG, M60		63	E5	d	Leg puncture		14		Y			
24	1-910124007	c	MG, M60		67	E4	d	Leg puncture		8		Y			
										Total Lost Work Days		.534			

24.27 Avg LWD/Injury
 22.25 Avg LWD/Case
 26.7 Avg LWD/LWD Case

PERSONAL INJURY - MATERIEL HANDLING PROFILES

PA# / IA - USING IMPROPER MATERIEL TYPE		TECHNIQUE FOR LIFTING OR LOWERING	LOCATION	MOS GRADE	TYPE INJURY	DAYS LOST
SEQ	GRP & CASE #					
1	900926034	Sandbags	Tng area	Unk	E6	d Back rupture
2	901007006	Camofl. nets	Tng area	Unk	E4	d Back strain
3	901108022	Arty projectile	Tng area	13	E5	d Groin hernia
4	901110029	Misc boxes	Travel way	76	E4	d Back strain
5	901210016	Sandbags	Tng area	Unk	E6	d Back strain
6	901212007	Misc boxes	Tng area	67	E6	d Back strain
7	910126014	Lumber	Tng area	13	E4	d Back strain
8	910218013	Maint stand	Tng area	68	E5	d Arm contusion
9	910223021	Track vch shoes	Tng area	63	E4	d Heel contusion
10	910324020	Side rail	Tng area	76	E4	d Face laceration
11	910327015	Metal spade	Veh fac	52	E2	d Toes fracture
12	910406012	Pallets	Svc fac	95	E3	c Finger amputation
13	900912002	Tent poles	Tng area	Unk	E3	d Chest puncture
14	901010029	Misc boxes	Storage bldggs	76	E4	d Back strain
15	910308008	Watercan	Tng area	88	E5	d Back strain
						Total Lost Work Days 182

12.1 Avg LWD/Case & Injury

13 Avg LWD/LWD Case

PERSONAL INJURY - MATERIEL HANDLING PROFILES (continued)

PA#1A - ATTEMPTING TO HANDLE EXCESSIVE LOAD WITHOUT SUFFICIENT MANPOWER		
SEQ	GRP & CASE #	MATERIEL TYPE
		LOCATION
1	901013023	Mail bag
		Tng area
2	901204020	Side rail
		Travel way
3	910211017	Carton
		Tng area
4	910406013	Pallet
		Trc area
Total Lost Work Days		53

13.25 Avg LWD/Case & Injury
 13.25 Avg LWD/LWD Case

PERSONAL INJURY - MATERIEL HANDLING PROFILES (continued)

PA#3 - TAKING INADEQUATE PRECAUTIONS FOR ENVIRONMENTAL HAZARDS						
SEQ	GRP & CASE #	ACTIVITY/MATERIEL	LOCATION	MOS	GRADE	TYPE INJURY
1	900X5016	Unloading pallets	Tng area	76	E5	d Heat injury
2	901005020	Unloading veh	Tng area	76	E3	d Heat injury
3	901007011	Unk	Tng area	63	E3	d Heat injury
•4	9-8907310MP	Unk	Tng area	55	E2	d Heat injury
•5	9-8901804008	Prep def position	Tng area	12	E4	d Heat injury
•6	9-8902040W9	Offloading veh	Tng area	12	E5	d Head laceration
•7	9-8901204012	Removing tarp	Tng area	55	E5	d Trunk contusion
•8	9-890204013	Unloading APC Range	Range	11	E3	d Shoulder dislocation
9	910209007	Unloading van	Tng area	36	E5	d Ribs contusion
10	910217024	Unloading truck	Tng area	82	E4	d Clavicle fracture
11	910405017	Unloading HEMIT Maint fac	Maint fac	76	E3	d Wrist fracture
Total Lost Work Days						62

5.64 Avg LWD/Case & Injury

5.64 Avg LWD/LWD Case

* NTC Accidents

PERSONAL INJURY - MAINTENANCE PROFILES

SEQ	GRP & CASE #	PAI TYPE	PAI TYPE OF MAINT	PA #1 - USING IMPROPER TOOLS OR EQUIPMENT			PA #1 - HAND TOOLS			DAYS LOST
				CODE - TYPE TOOL/EQUIP	LOCATION	MOS	GRADE	CODE/TYPE INJURY		
2	900917021	c	Tracked veh	a Hammer	Tng area	19	E3	d Arm puncture	3	
5	900926028	b	A/C maint	a Voltmeter	Aisfield	67	E5	d Body shock	2	
6	900926032	a	Eng. equip (gen)	a Flashlight	Tng area	13	E4	d Thumb fracture	10	
8	901012027	c	Personal equip	a Knife	Tng area	31	E4	d Finger laceration	4	
11	901119014	c	Bldg. maint	a Nail remover	Housing fac	88	E4	d Hand puncture	2	
12	901120012	b	Wheeled veh	a Lug wrench	Veh fac	Unk	E3	d Arm contusion	5	
15	901202012	c	Electronic	a Knife	Tng area	31	E5	d Eye laceration	60	
16	901213008	c	Wheeled veh	a Screwdriver	Tng area	91	E4	d Eye abrasion	7	
22	901322019	c	Tracked veh	a Siphon hose	Tng area	19	E3	d Internal poisoning	1	
23	910126015	b	Wheeled veh	a Breaker bar	Tng area	63	E4	d Nose fracture	2	
24	910129011	b	Wheeled veh	a Lug wrench	Tng area	88	E5	d Head contusion	1	
25	910129013	b	Furniture repair	a Hacksaw	Maint fac	67	E6	d Thumb laceration	3	
28	910411022	b	Wheeled veh	a Electric grinder	Veh fac	44	E3	d Face laceration	1	
29	910499013	b	Wheeled veh	a Ratchet handle	Tng area	88	E5	d Finger crushed	3	
					Total Lost Work Days	104				

7.43 Avg LWD/Case & Injury
7.43 Avg LWD/LWD Case

PERSONAL INJURY - MAINTENANCE PROFILES (continued)

PA #1 - USING IMPROPER TOOLS OR EQUIPMENT - HOISTS, LIFTS, JACKS						
SEQ	GRP & CASE #	PA1	TYPE OF MAINT	CODE - TYPE TOOL/EQUIP	LOCATION	MOS GRADE
13	901127011	b	Wheeled veh	b	Hoist	Vehfac
14	901130007	c	Wheeled veh	b	12T Jack	Vehfac
21	910321019	c	Wheeled veh	b	Sling lift	Vehfac
						Total Lost Workdays
						8

2.67 Avg LWD/Case & Injury
 4 Avg LWD/LWD Case

PERSONAL INJURY - MAINTENANCE PROFILES (continued)

PA#1 - USING IMPROPER TOOLS OR EQUIPMENT - PCE									
SEQ	GRP & CASE #	PAI TYPE	TYPE OF MAINT	CODE - TYPE TOOL/EQUIP	LOCATION	MOS	GRADE	CODE/TYPE INJURY	DAYS LOST
1	910815018	a	Wheeled veh	c PCE-safety cage	Tng area	77	E5	d Chest confusion	1
3	910923013	a	A/C Maint	c PCE-Eye protect.	Maint/fac	68	E4	d Eyes chem burn	3
4	910923016	a	Wheeled veh	c PCE-Gloves	Veh/fac	88	E1	d Head laceration	10
7	910101033	a	Wheeled veh	c PCE-Eye protect.	Maint/fac	68	E4	d 'Eye perforat	60
9	9101022016	a	Wheeled veh	c PCE-safety cage	Tng area	Unk	E4	d Skull fracture	90
10	911105022	a	Tracked veh	c PCE-gloves	Tng area	19	E4	d Head laceration	10
17	910117012	a	Eng equip (gen)	c PCE-Eye protect.	Tng area	63	E7	d Eye unkown	5
18	910218009	a	Battery maint	c PCE-Eye protect.	Veh/fac	63	E4	d Eyes chem burn	2
19	910222006	a	Pump maint	c PCE-Eye protect.	Tng area	77	E3	d Eyes chem burn	3
20	910228017	a	Eng equip(gen)	c PCE-Eye protect.	Tng area	19	E5	d Eyes chem burn	1
Total Lost Workdays									185

18.5 Avg LWD/Case & Injury
18.5 Avg LWD/LWD Case

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APPENDIX D
REFERENCES

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REFERENCES

1. Field Manual 100-5, Operations
2. Field Manual 100-10, Combat Service Support
3. Field Manual 100-15, Corps Operations
4. Field Manual 100-20, Military Operations in Low-Intensity Conflict
5. Field Manual 63-4, Combat Service Support Operations - Theater Army Command
6. Field Manual 71-100, Division Operations
7. Field Manual 101-5, Staff Organization and Operations
8. Army Regulation 385-10, The Army Safety Program
9. Army Regulation 5-3, Installation Management and Organization
10. Army Regulation 384-40, Accident Investigation and Reporting
11. Rules of Engagement, National Training Center

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APPENDIX E
GLOSSARY

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GLOSSARY

ACV	Army combat vehicle
AMV	Army motor vehicle
APAR	Army preliminary accident report
AR	Army regulation
ATWESS	Antitank Weapons Effect Signature Simulator
CS	combat support
CSS	combat service support
CTC	combat training center
CUCV	commercial utility cargo vehicle
DFOP	damaged, but fully operable
DINOP	damaged, and inoperable
DPTOP	damaged, but partially operable
DS/S	Desert Shield/Storm
FM	field manual
FTX	field training exercise
FY	fiscal year
HEMTT	Heavy Expanded Mobility Tactical Truck
HMMWV	Highly Mobile Maneuverable Wheeled Vehicle
MACOM	major Army command
METL	Mission Essential Task List
MOS	military occupational specialty
MPH	miles per hour
MSR	main supply route
NCA	National Command Authority
NO.	number
NTC	United States Army National Training Center
OC	observer/controller
OPLAN	operations plan
OSHA	Occupational Safety and Health Act
OPORD	operations order
PA	problem area
PI	personal injury
POD	point of departure
POE	point of entry
REF	references
SME	subject matter expert
SWA	Southwest Asia
TD	totally destroyed
UNK	unknown
USAREUR	United States Army Europe
USASC	United States Army Safety Center

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